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A taxonomic revision of *Alabagrus* (Hymenoptera: Braconidae)

Michael J. Sharkey

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A taxonomic revision of *Alabagrus* (Hymenoptera: Braconidae)

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Synopsis

Alabagrus Enderlein, a genus of New World, primarily Neotropical Agathidinae, is revised and redefined to include *Astriria* Enderlein, *Craspedobothrus* Enderlein and *Liyptia* Enderlein which are newly synonymised. Of the 104 included species, 78 are newly described and 24 are new combinations. An illustrated key to species and a description and mapped distribution for each species are given. Cladistic relationships are proposed at species level and the phylogenetic placement of *Alabagrus* in the Agathidinae is discussed.

Introduction and historical review

Species of *Alabagrus* are rather large agathidine braconids that are restricted to the warm temperate and tropical regions of the New World. They are internal parasitoids of larvae of Lepidoptera that live in concealed habitats such as plant stems and rolled leaves. At least seven species of *Alabagrus* are of direct importance in the natural control of lepidopterous pests. Historically, the most noteworthy of these is *Alabagrus stigma* (Brullé) which attacks the sugar cane and rice borer *Diatraea saccharalis* (F.). The purpose of this revision is to delimit and describe the species of this large genus, to place them into a phylogenetic perspective and to provide a key to their identification.

Alabagrus was erected by Enderlein (1920) for several species of Neotropical agathidines of which the type-species *Alabagrus citreistigma* is a junior synonym of *Alabagrus stigma* (Brullé). My concept of *Alabagrus* is broader than Enderlein's and includes three other genera that he (1920) erected, viz. *Astiria* **syn. n.**, *Craspedobothrus* **syn. n.** and *Liyptia* **syn. n.** Justification for these synonyms is presented in the section on phylogeny. Before Enderlein's (1920) work on agathidine genera, and even after (see Muesebeck, 1927), authors described species of *Alabagrus* under *Microdus* and *Bassus* and in one case under *Cremnops*. Without explanation or justification, Muesebeck & Walkley (1951) synonomized *Alabagrus* under *Agathis* and Shenefelt (1970) adopted this system in his catalogue of world Agathidinae. *Astiria* and *Craspedobothrus* were accepted as discrete genera by Shenefelt (1970) though no one has added species to these genera since they were erected.

Alabagrus species have been relatively well collected because of their large size and beautiful colour patterns, moreover they are easily collected with Malaise traps. This revision includes 104 species, of which 26 were previously described and 78 are new to science. Despite attempts to

amalgamate all available material, this number may represent only 80–90% of the total number of species. When this work was nearly completed I visited most of Europe's major entomological museums to examine types and collections of miscellaneous Agathidinae; I was encouraged to find very few species that were not included in my revision. This leads me to believe that most or all of the widespread, common species of *Alabagrus* are included in this work.

Material and methods

Specimens examined

Approximately 12,000 specimens of *Alabagrus* were examined; most were borrowed from the 22 institutions listed in the next section.

Previously named species that are included in my concept of *Alabagrus* were usually described in *Bassus* and *Microdus* by earlier authors. However, their descriptions are generally so vague that it was difficult to be sure to what genus they belong. For this reason I examined almost all of the Neotropical Agathidinae types. Shenefelt's (1970) catalogue of the Agathidinae was an invaluable aid in this endeavor.

All species distributions are mapped from data of specimens that I examined. Localities are plotted for all species but, to conserve space, I list exact locality data only for the newly described species. For previously described species I include a list of museums and institutions where specimens that I have determined are deposited. The distributional data are listed alphabetically by country, province and finally, nearest city. Details not included on the specimen label are placed in square brackets.

The etymology of the new species names is not provided; most of the names are derived from native languages of Central and South America although there are also some patronyms.

Abbreviations of depositories

The abbreviations used here are taken from Heppner & Lamas (1982).

Argentina: IML; Fundacion e Instituto Miguel Lillo, Universidad Nacional de Tucuman, San Miguel de Tucuman.
Austria: NHMV; Naturhistorisches Museum, Vienna.
Canada: CNC; Canadian National Collection, Biosystematics Research Centre, Agriculture Canada, Ottawa, Ontario.
East Germany: ZMHB; Zoologisches Museum, Humboldt Universität, Berlin.
England: BMNH; British Museum (Natural History), London.
Hungary: TMB; Természettudomanyi Muzeum, Budapest.
Netherlands: RNHL; Rijksmuseum van Natuurlijke Historie, Leiden.
Trinidad: CIBC; Commonwealth Institute of Biological Control, Curepe.
United States of America:
AEI; American Entomological Institute; Townes' Collection, Gainesville, Florida.
AMNH; American Museum of Natural History, New York, New York.
ANSP; Academy of Natural Sciences, Philadelphia, Pennsylvania.
CU; Cornell University, Ithaca, New York.
FSCA; Florida State Collection of Arthropods, Florida Department of Agriculture and Consumer Services, Gainesville, Florida.
MSUE; Michigan State University Collection, East Lansing, Michigan.
SMEK; Snow Museum of Entomology, University of Kansas, Lawrence, Kansas.
SC; Collection of Dr R. Shenefelt (now amalgamated with AEI, Gainesville, Florida).
TAMU; Texas A&M University, College Station, Texas.
USNM; United States National Museum, Smithsonian Institution, Washington, D.C.
UCB; Essig Museum of Entomology, University of California, Berkeley, California.
UGA; University of Georgia, Athens, Georgia.
Venezuela: UCV; Instituto de Zoologia Agricola, Universidad Central de Venezuela, Maracay.
West Germany: LFAZ; Lehrstuhl für Angewandte Zoologie, Maximilians Universität, Munich.
ZSBS; Zoologische Sammlungen des Bayerischen Staates, Munich.

Collection and preservation

Members of *Alabagrus* are best collected with Malaise traps. My own experience in Ecuador and Guatemala indicates that they are usually too wary and quick to be swept with great success, although this method is good for smaller species.

If specimens are collected into alcohol, which is usual for Malaise traps, care must be taken when they

are prepared for mounting. If they are air-dried directly from alcohol, setae often adhere to the cuticle, obscuring many morphological structures. Air-drying also causes the soft tissues of the abdominal sternum to collapse and interesting characters are thereby lost. Critical-point drying avoids these problems and usually produces high-quality specimens, but this method is expensive and rather time consuming for large specimens. A simple method that achieves better or equal results is to immerse the specimens in 95% ETOH and 100% ETOH each for 24 hours, then in chloroform for two hours, after which time they are air-dried. This procedure stops the shrinking of soft membranes and all pilosity stands erect, away from the body. If sets of small cages or perforated polyester bags are used, the method is very rapid and great quantities of braconids may be processed in one run.

Others (e.g. Vockeroth 1966) have used xylene or amyl acetate instead of chloroform but the results are not as good.

Terminology

The terminology used for wing veins is illustrated and explained in Riegel (1948). All other terms are defined and illustrated in Richards (1977). A few that are not used by all hymenopterists are defined below.

Epicnemium. Semicircular sclerite of the mesepisternum posterior to the fore coxa.

Mesosoma. The thorax plus propodeum.

Metasoma. Abdomen minus the first segment (propodeum).

Measured characters

Several morphometric characters are used in this study. Methods to measure these are described below.

Body length. This measurement does not include the ovipositor or antennae.

Ovipositor length. The ovipositor is exserted to various degrees and usually curved. To be measured accurately, the specimen must be relaxed and the ovipositor pulled until its base is exposed. After some practice it is easy to estimate the length from undissected specimens, measuring the ovipositor length from the base of the hypopygium.

Hind femur. This is measured in lateral view from the most distal end of the trochantellus to the apex of the femur.

Metasomal terga. The length of the first tergum is measured medially, from the apex to the distal end of the small foramen from which the metasomal elevator muscles issue. The width is the maximum width of the median tergite, i.e. lateral tergites are not included. The length of the 2nd metasomal tergum is measured medially.

Species limits

I define a species as a group of organisms of common descent that is reproductively isolated from other such groups. I interpret morphological differences or gaps as evidence of reproductive isolation. However, without large collections from numerous localities it is often difficult to determine if any two morphologically different specimens from separate localities are different species or simply varieties of one polytypic species.

A study of *Alabagrus texanus* and *Alabagrus stigma*, two species represented by over 500 specimens, including long reared series, enabled me to better understand intraspecific morphological variability in *Alabagrus* and to determine which character states are variable and therefore not reliable indicators of species limits. For example, character states that do not vary greatly in *Alabagrus texanus* could be presumed to be consistent in other species as well. Unfortunately, this study gave ambiguous results; *A. texanus* appears to have low intraspecific variability for many characters whereas *A. stigma* has great intraspecific variability for the same characters. All specimens of *A. texanus* have infuscate fore wings (Fig. 16) whereas members of *A. stigma* have many different wing colour patterns (*cf.* Figs 17e, 19d, 20f). The propodea of specimens of *A. texanus* are areolate whereas those of *A. stigma* are punctate, to rugoso-punctate, to areolate, with all intermediates present. Based on other species, represented by fairly large series in my collections, the variation found in *A. stigma* is exceptional. Consequently, the intraspecific stability or reliability of character states throughout *Alabagrus* is based on that found in *A. texanus*. This standard is used to separate species where apparent disjunct ranges or small numbers of specimens preclude an independent assay of variability.

Biology

Members of *Alabagrus*, like all agathidines, parasitize the larvae of Lepidoptera. Two major groups of Agathidinae may be distinguished on the basis of their hosts. One group, including *Coccygidium* Sanssure and *Disophrys* Foerster parasitize the exposed larvae of Noctuidae. Females of these genera are

characterized by short, strong, decurved ovipositors that are usually about one-third of the length of the metasoma. The other group parasitize lepidopterous larvae that are hidden in plant tissues, such as stem borers, leaf rollers and leaf tiers. These hosts are primarily in the superfamilies Tortricoidea and Pyraloidea. Females of this group of Agathidinae, to which *Alabagrus* belongs, usually have long ovipositors which are needed to reach their concealed hosts. Females of *Alabagrus* have ovipositor lengths ranging from about as long as the metasoma to almost twice the body length.

Hosts are known for only seven species of *Alabragus*, i.e., *A. imitatus, A. parvifasciatus, A. sanctus, A. stigma, A. texanus, A. versicolor* and *A. xipe*. From these limited host data three generalizations can be made. First, members of *Alabagrus* with known hosts are polyphagous except *A. imitatus* and *A. xipe*; second, they are exclusively or almost exclusively parasites of larvae of Pyralidae; and third, the species can be divided into two groups: those that attack stem boring Pyralidae and those that attack leaf rolling and leaf tieing Pyralidae.

Most species of *Alabagrus* with host records are associated with agroecosystems and their habit of polyphagy may be an anomaly that makes them suitable for this habitat. Dr I. Gauld (pers. comm.) has found that *Enicospilus americanus* (Christ), a common ophionine ichneumonid associated with agroecosystems, attacks most saturniids but that other species in this group in Mesoamerica are host specific. Likewise, most species of *Alabagrus*, could be host specific with only those associated with agroecosystems being polyphagous. Many more host records will be needed to verify or refute this hypothesis.

Of the 25 different species of Lepidoptera that are parasitized by the seven species of *Alabagrus* listed above, all are Pyralidae except for one catalogue record of *A. versicolor* attacking *Alabama argillacea* Hübner, a noctuid moth, and a reference in Shenefelt (1970) to *A. stigma* attacking *Laphygma frugiperda* (A. & S.), also a noctuid. I have reason to doubt the veracity of both of these records. For example, Shenefelt (1970) attributes the *A. stigma* host record to Myers (1932), but I could not find a reference to this host in Myer's publication.

Members of *Alabagrus* appear to be restricted in their choice of host by ecological as well as taxonomic limits. Of the six hosts recorded for *A. texanus*, all are pyralid leaf rollers or leaf tiers, except for the dubious record mentioned previously. All hosts of *A. stigma* are pyralid stem borers in rice, corn and sugar cane.

Hummelen (1974) studied the biology of *A. stigma* (as *Agathis stigmaterus*). Several of his findings conform with the life histories of other agathidines: the early instar larva has a caudal process and pseudopodia; after an initial period of relatively slow growth the parasite goes through a period of rapid development, then leaves the host's body and begins to feed externally, killing the host and rapidly consuming most of it except the head capsule; the parasite then spins a cocoon and shortly afterwards pupates.

The larvae of some species of *Alabagrus* wait for their host to spin a cocoon or part of one before producing one themselves, e.g. *A. texanus* (see Needham, 1955), others do not, e.g. *A. stigma*. Perhaps this behaviour is correlated with host niche. When a host is well protected in a stem the parasitoid may not need the extra protection of the host cocoon.

Hummelen (1974) found that *A. stigma* is obligately thelytokous, i.e. unfertilized diploid eggs produce females. His observations showed that haploid males are produced rarely (1.5%), but that these are probably functionless as he did not observe copulation when both sexes were placed together.

Based on specimens in my collection, most species of *Alabagrus* seem to have approximately equal numbers of males and females; however, about 10% of the species of *Alabagrus* have sex ratios that suggest obligate thelytoky. For details on the life histories of *A. stigma* and *A. texanus* see Hummelen (1974) and Needham (1955) respectively.

Character analysis

Each character used in the descriptions, character matrix and phylogenetic analysis is defined and discussed below. The complexity and variability of each character as well as the polarities (relative ages) assigned to the various character states of some characters are justified in this section.

Character states are polarized using outgroup analysis (Watrous & Wheeler, 1981; Wiley, 1981). *Pharpa* Sharkey is proposed as the sister group of *Alabagrus* and is used as the outgroup. Character states were also examined in *Bassus* Fabricius and other Agathidinae genera to confirm decisions and to check characters that are ambiguous in *Pharpa*, i.e., where both character states or neither are present in *Pharpa*. For two-state characters both the plesiomorphic and apomorphic states are given when there is evidence to support a particular hypothesis. For characters with three or more states only the ground-plan state for *Alabagrus* is given. Other states are coded as apomorphic but only rarely are transformation series hypothesized.

Many species of *Alabagrus* have sexually dimorphic characters such as body colour, wing pattern and various sculptural patterns. In all cases of sexual dimorphism where outgroup analysis gave an unambiguous polarity decision, males exhibit the plesiomorphic character state.

Body colour

Body colour refers to the colour of the mesosoma and metasoma and not that of the head or appendages. The body colour of members of *Alabagrus* varies from yellow-orange to black, but most species have a combination of pale and dark colours. I have only rarely attempted to use these character states for phylogenetic purposes but they are of some importance in identifying species. If most specimens of a particular species are black but a small percentage show a little pale coloration then the species is coded in the character matrix as being all black. The same applies to those species that are usually pale-coloured. Species with some melanic marks are coded as pale if the dark coloration is restricted to the propleura and anteroventral portion of the pronotum, or if there is only some black mottling on the metasoma, or if the black colour is restricted to the apex of the metasoma. The most widespread colour pattern in *Alabagrus* is black with a pale median region composed of the metapleuron, propodeum, and first three segments of the metasoma. This is also the colour pattern most widespread in New World *Bassus* and *Pharpa*, hence it is considered the ground-plan state for *Alabagrus*. Most species are relatively consistent in colour although rarely, e.g. *A. stigma*, the colour may vary considerably.

Antennal colour

Primitively the antennae are concolorous with the head. This is the most widespread state in the Agathidinae including *Pharpa*. There are two apomorphic states in *Alabagrus*, antenna paler than head and antenna with a yellow band. Both of these states are considered to be independently derived from the ground-plan state.

Wing colour patterns (Figs 16–20)

There are many different wing colour patterns in *Alabagrus*. *Pharpa* also shows many wing patterns as do many large diurnal braconids of the lowland Neotropics. Presumably these are the result of adaptation to local mimetic patterns. Because of polymorphism and convergence due to local selection pressures, these patterns are not considered reliable for phylogenetic analysis. Most species (90%) possess only one character state. Some are sexually dimorphic and and others are polymorphic with several character states and intermediates.

I believe that the primitive character state is an infuscate wing (Fig. 16), for the following reasons: this state is present in *Pharpa*; of the character states present in *Alabagrus* it is the most widespread in the Agathidinae; in several sexually dimorphic species males have the infuscate state while females have various other patterns, e.g. *A. maculipes*, *A. cara*. In all other cases of sexually dimorphic characters investigated in *Alabagrus*, males exhibit the plesiomorphic state.

Number of flagellomeres

This is an important character at the species-group level, but usually it is not useful to separate morphologically similar species. The number of flagellomeres varies from 32 to 56 in *Alabagrus*. The number of flagellomeres varies by five in *A. texanus*, a species of which I examined over 550 specimens. I estimate that the total number of flagellomeres varies by four or five for species with many segments and by two or three for those with fewer articles. The exact intraspecific range is difficult to estimate for all but a few species because of the lack of long series from different localities.

I believe a high flagellomere number to be the plesiomorphic condition because members of *Pharpa* have between 50 and 60 flagellomeres. Other agathidine genera vary widely in this character.

Shape of the gena (Figs 2a–f)

In lateral view the ventral portion of the gena has a number of different shapes. Genal shape may often be used to distinguish otherwise very similar species and generally it is a stable character intraspecifically, although a few species are intermediate between the various character states defined below.

A rounded gena (Fig. 2b) is considered plesiomorphic for *Alabagrus*. This is the character state in *Pharpa* and it is the most widespread state in the Agathidinae, including basal lineages like *Earinus*. All other states are encountered elsewhere in the Agathidinae, but only rarely and not in closely related genera.

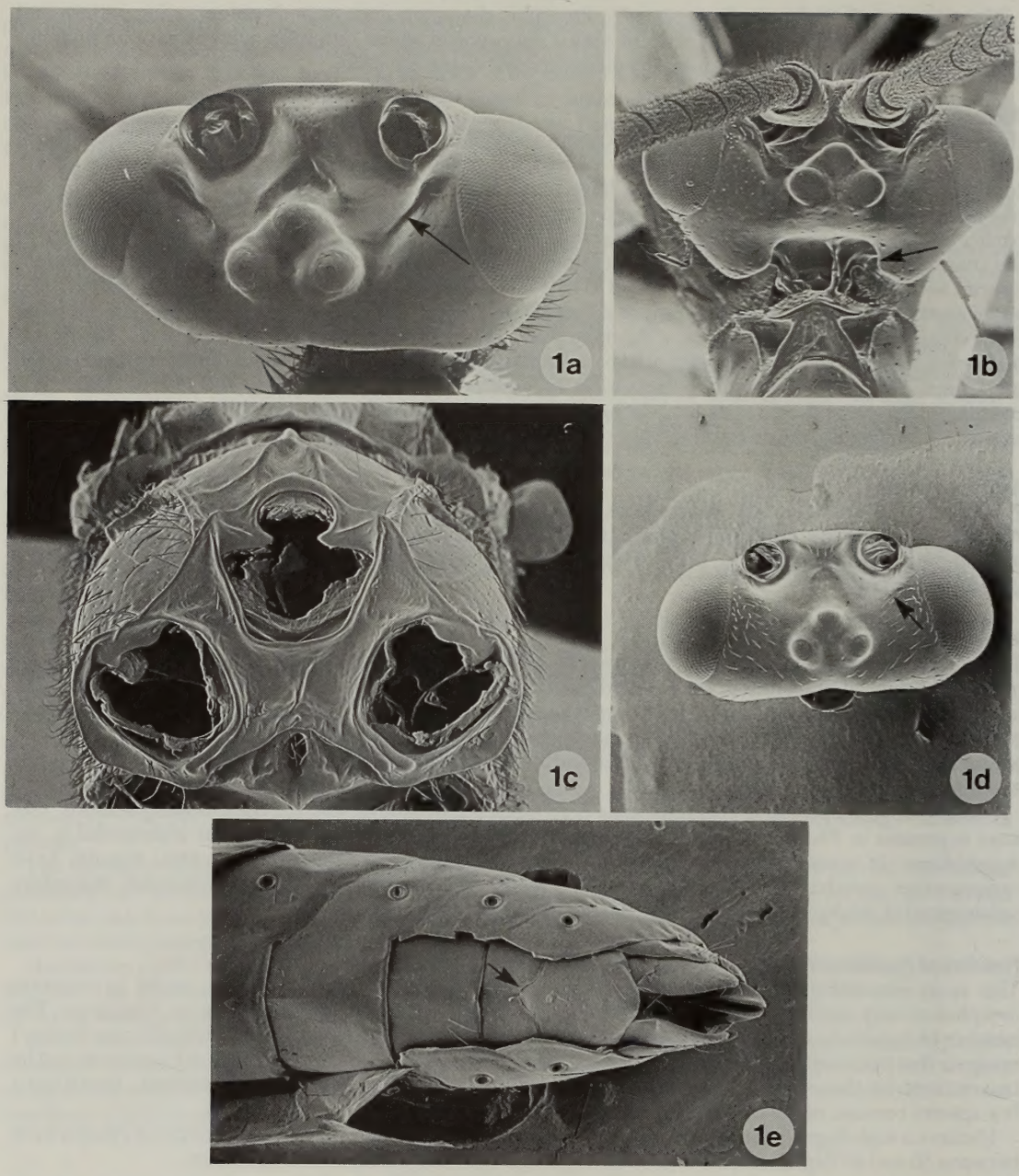
The character states are as follows:

Gena rounded (Figs 2b, f), plesiomorphic

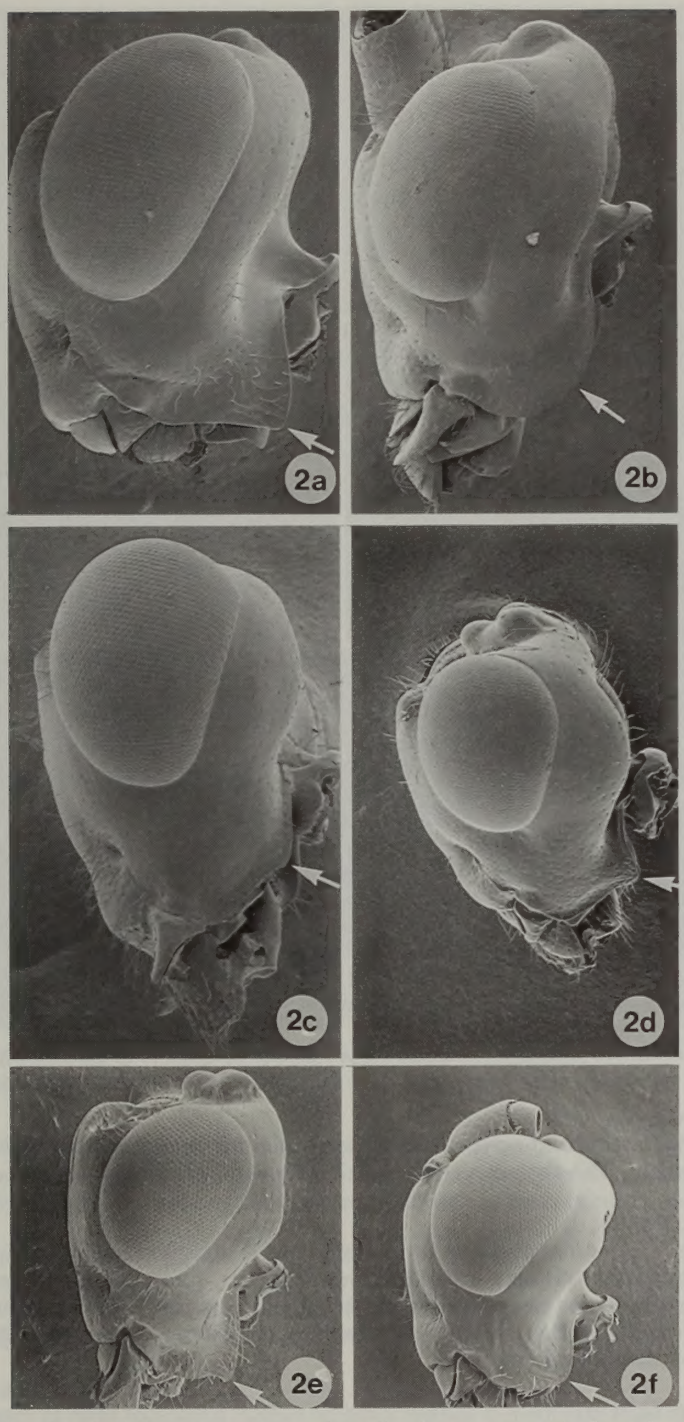
Gena with obtuse angle posteriorly (Fig. 2c)

Gena acute posteroventrally (Fig. 2e)

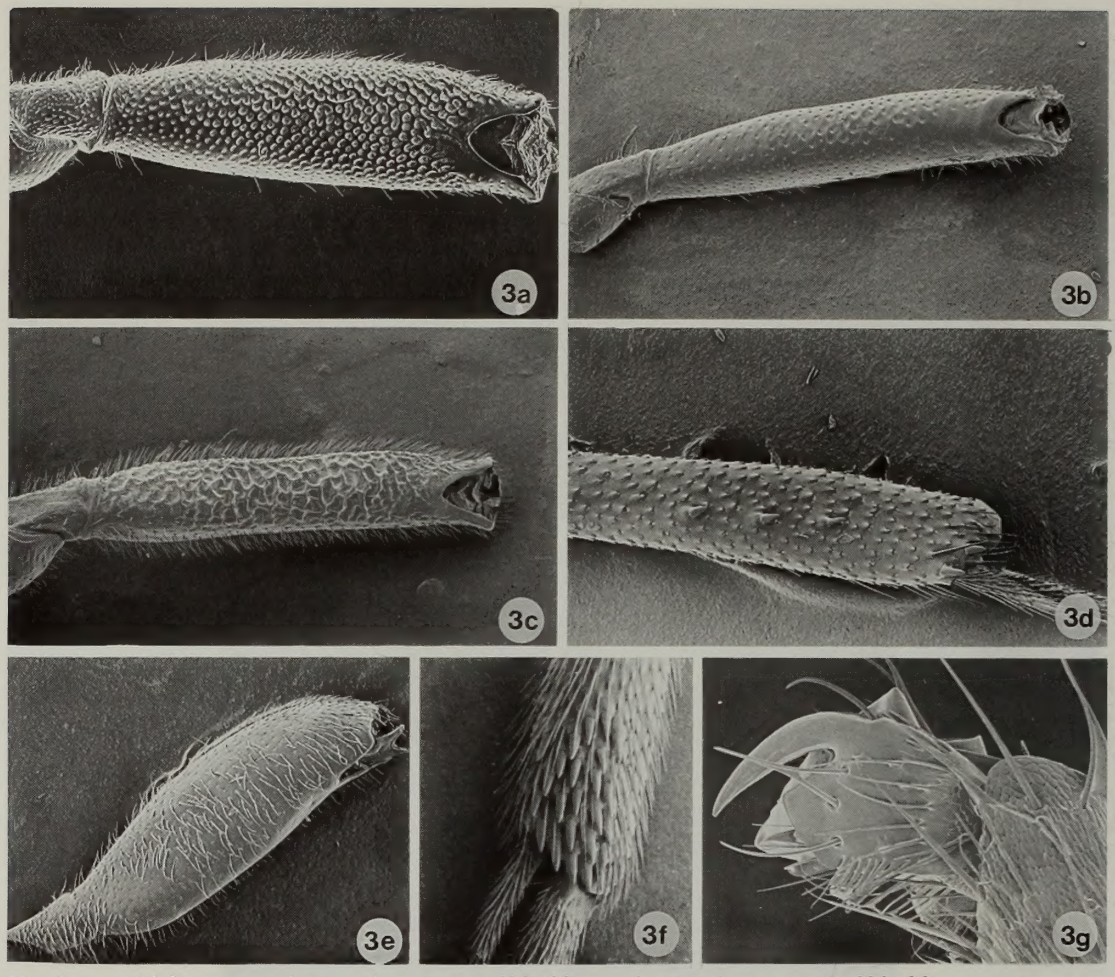
Gena right-angled posteroventrally (Fig. 2d)



Figs 1a–e *Alabagrus* species. a, *tripartitus*, dorsal head; b, *kiska*, dorsal head; c, *erythromelas*, posterior mesosoma, with metasoma and hind legs removed; d, *uchuk*, dorsal head; e, *parvifasciatus* ♂, ventral metasoma.



Figs 2a–f Lateral heads, of *Alabagrus* species. a, *latreillei*; b, *texanus*; c, *juchuy*; d, *versicolor*; e, *arawak*; f, *elatoscutum*.



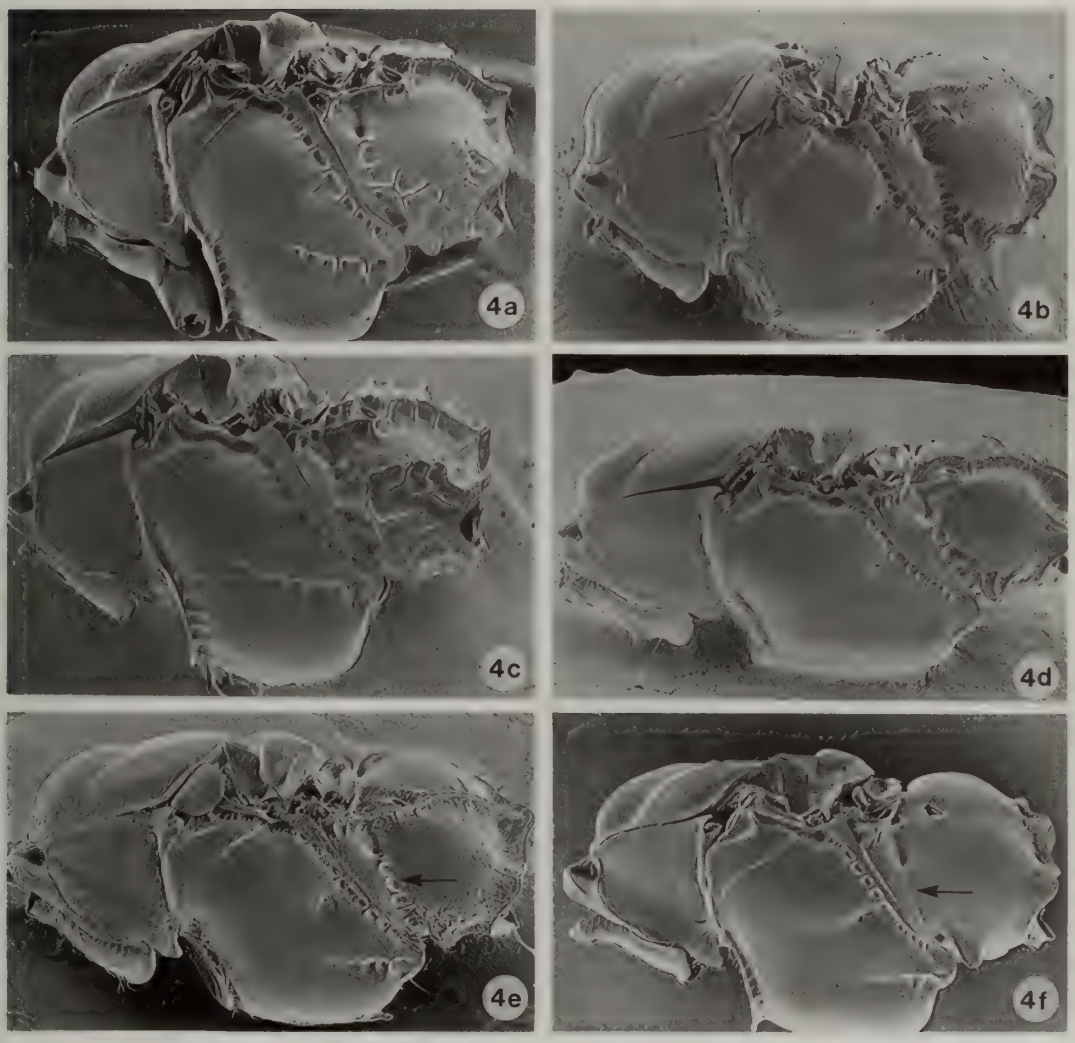
Figs 3a–g *Alabagrus* species. a, *stigma*, ventral hind femur; b, *tricarinatus*, ventral hind femur; c, *texanus*, ventral hind femur; d, *maculipes*, apicolateral mid tibia; e, *latisoma*, lateral hind femur; f, *versicolor*, distal hind tibia; g, *stigma*, tarsal claw.

Ridge laterad of the clypeus
The presence of a ridge laterad of the clypeus is synapomorphic for three species of *Alabagrus* in which they occur in various strengths. This character state is not known in other agathidines.

Shape of the occiput (Figs 1b, d)
Viewed dorsally, the shape of the occiput varies considerably. A sharply excavated occiput, an apomorphic character state, is important to distinguish a small group of species. This condition is similar to that found in *Aerophilus brulléi* Szépligeti and several undescribed species of *Bassus*. However, an unexcavated occiput (Fig. 1d) is most widespread in the Agathidinae and present in all species of *Pharpa*. I therefore consider it to be the ground-plan state for *Alabagrus*.

Carinae of frons (Figs 1a, b, d)
The presence of lateral carinae on the frons is a character state that may be the ground-plan state for the Agathidinae because it is widespread within the subfamily. The carinae vary greatly in shape and different states of the character are easily defined. One such state is a synapomorphy for *Pharpa* plus *Alabagrus* (Fig. 1a). In members of these two genera the carinae are rounded, not greatly elevated, and they run in a rather straight line from the lateral and median borders of each antennal socket to the median ocellus.

The plesiomorphic character state in *Alabagrus* is well-developed carinae, as in *Pharpa* (Fig. 1a). Some

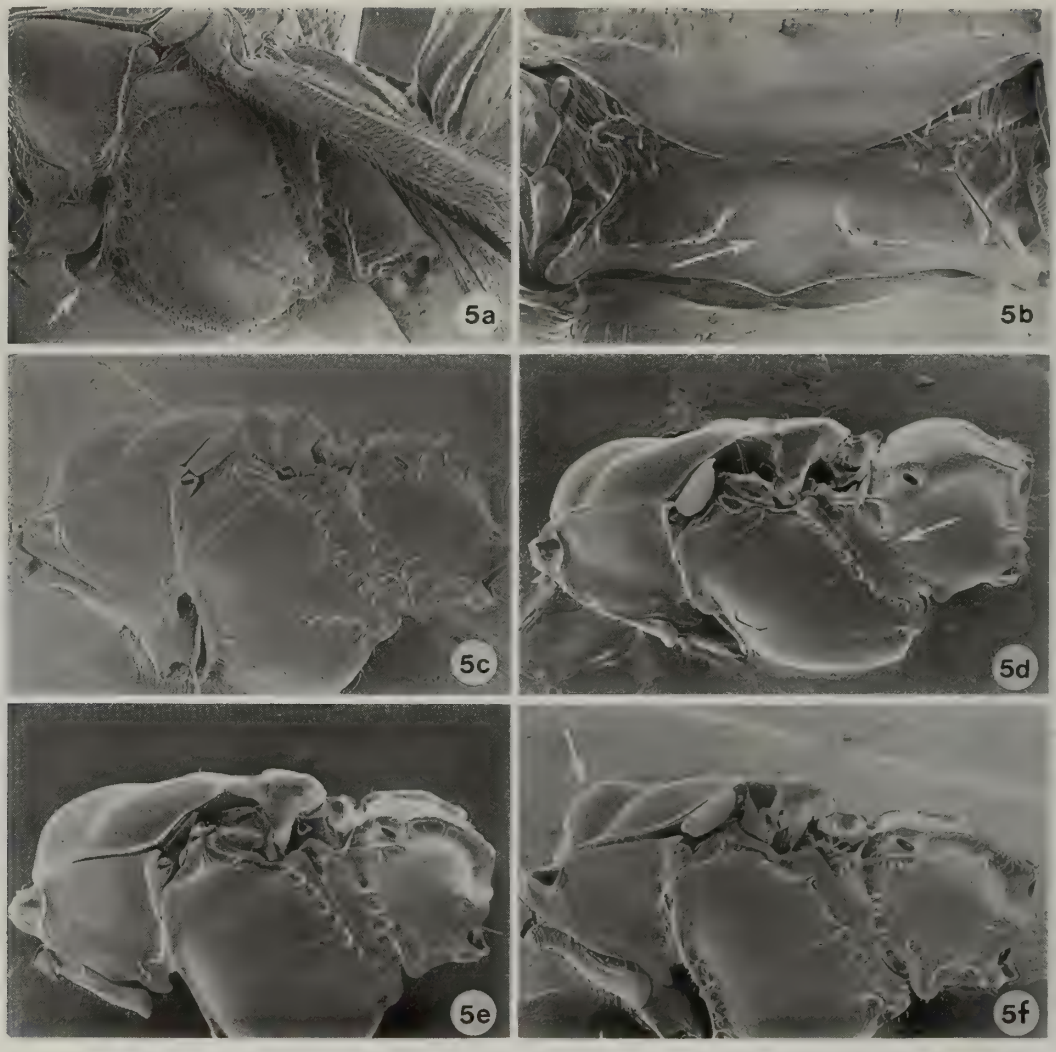


Figs 4a–f Lateral mesosoma of *Alabagrus* species. a, *albispina*; b, *imitatus*; c, *texanus*; d, *parvifasciatus*; e, *masneri*; f, *haenschi*.

species of *Alabagrus* have the carinae reduced (Fig. 1d) and this is apomorphic in *Alabagrus*. Reduction of the carinae on the frons is not correlated with reduction of carinae and sculpture on the mesosoma and metasoma.

Notauli (Fig. 7a–d)
The presence of well-improessed notauli is plesiomorphic; they are present in *Pharpa* and most genera of Agathidinae. Notauli may be weakly impressed or completely absent in *Alabagrus*.

Longitudinal ridge of scutum (Fig. 7d)
Anteriorly the scutum of most species of *Alabagrus* has a rounded, median, longitudinal ridge, bounded laterally by longitudinal depressions. This character state occurs in many other agathidine taxa, e.g. *Cremnops* Foerster, *Euagathis* Szépligeti, *Coccydium* and *Zelomorpha* Ashmead. Although the ridge is absent in *Pharpa*, the hypothesized sister group of *Alabagrus*, and some other genera of Agathidinae, I consider presence of the ridge to be the ground-plan state for *Alabagrus* because it is more likely that the state was lost in *Pharpa* rather than independently gained in *Alabagrus*. The loss of this ridge therefore is considered apomorphic within *Alabagrus*.

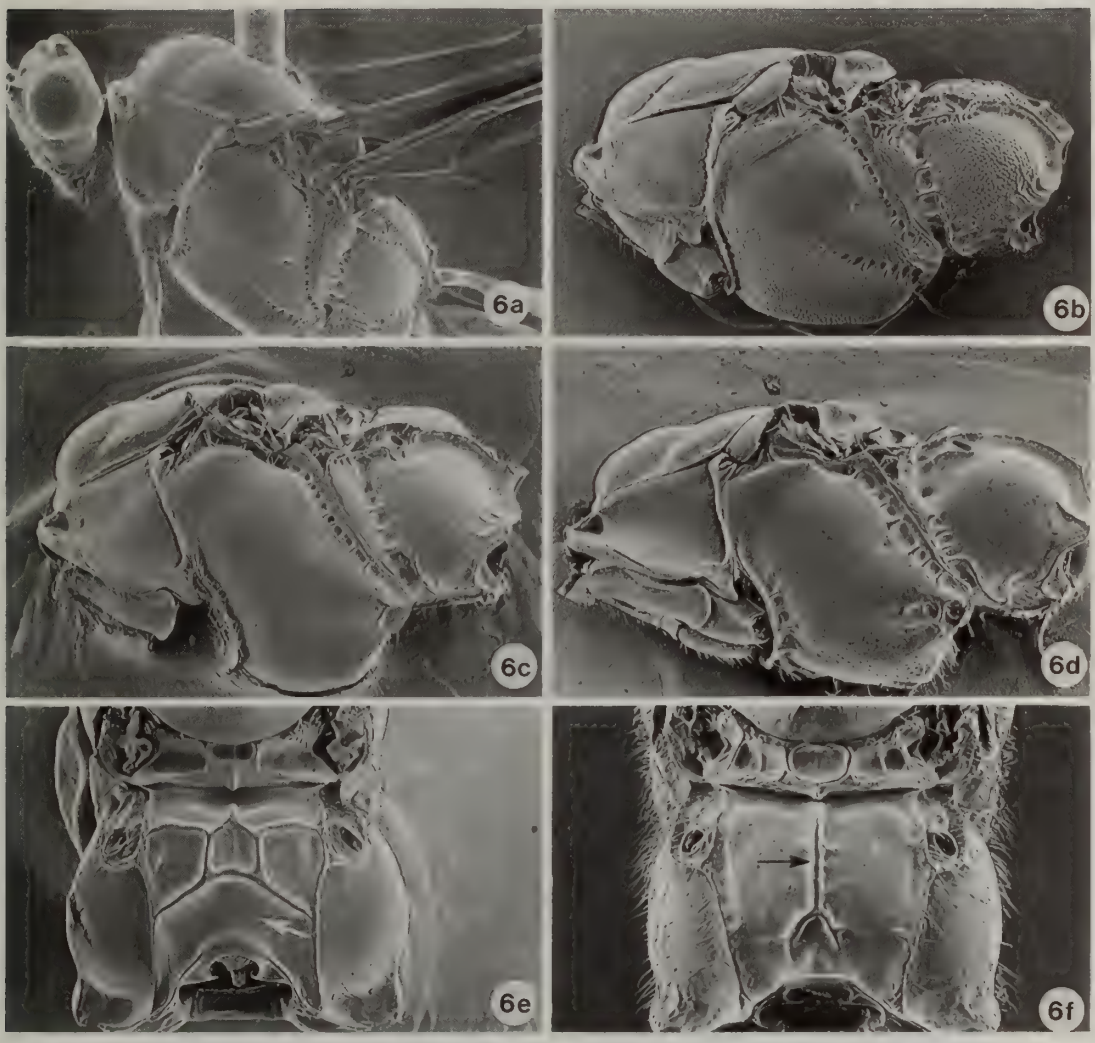


Figs 5a–f *Alabagrus* species. a, *varipes*, lateral mesosoma; b, *paruyana*, dorsal metanotum; c, *nigrilitus*, lateral mesosoma; d, *kiska*, lateral mesosoma; e, *versicolor*, lateral mesosoma; f, *elatoscutum*, lateral mesosoma.

Longitudinal carina of scutellar furrow
There are from zero to three longitudinal carinae in the scutellar furrow. This number is often much higher in other genera of Agathidinae, therefore a high number of carinae is assumed to be plesiomorphic; however, because of many intermediate states and intraspecific variability, this character has not been used in the phylogenetic analyses. The character is useful to help identify some species.

Posterior transverse ridge of scutellum (Figs 8a–d)
The scutellum may or may not have a transverse ridge, the presence of which is considered plesiomorphic. A ridge is present in most genera of Agathidinae, including *Bassus, Coccydium, Euagathis, Disophrys* and *Cremnops*. A transverse ridge is absent from *Pharpa* and I believe this to be a derived condition in that genus. I consider it more likely that the scutellar ridge was lost in *Pharpa* and independently in some *Alabagrus* rather than lost in the common ancestor of both taxa and regained in *Alabagrus*.

Median areola of metanotum (Figs 8a–d)
The median areola of the metanotum is usually well excavated and delimited by raised margins laterally

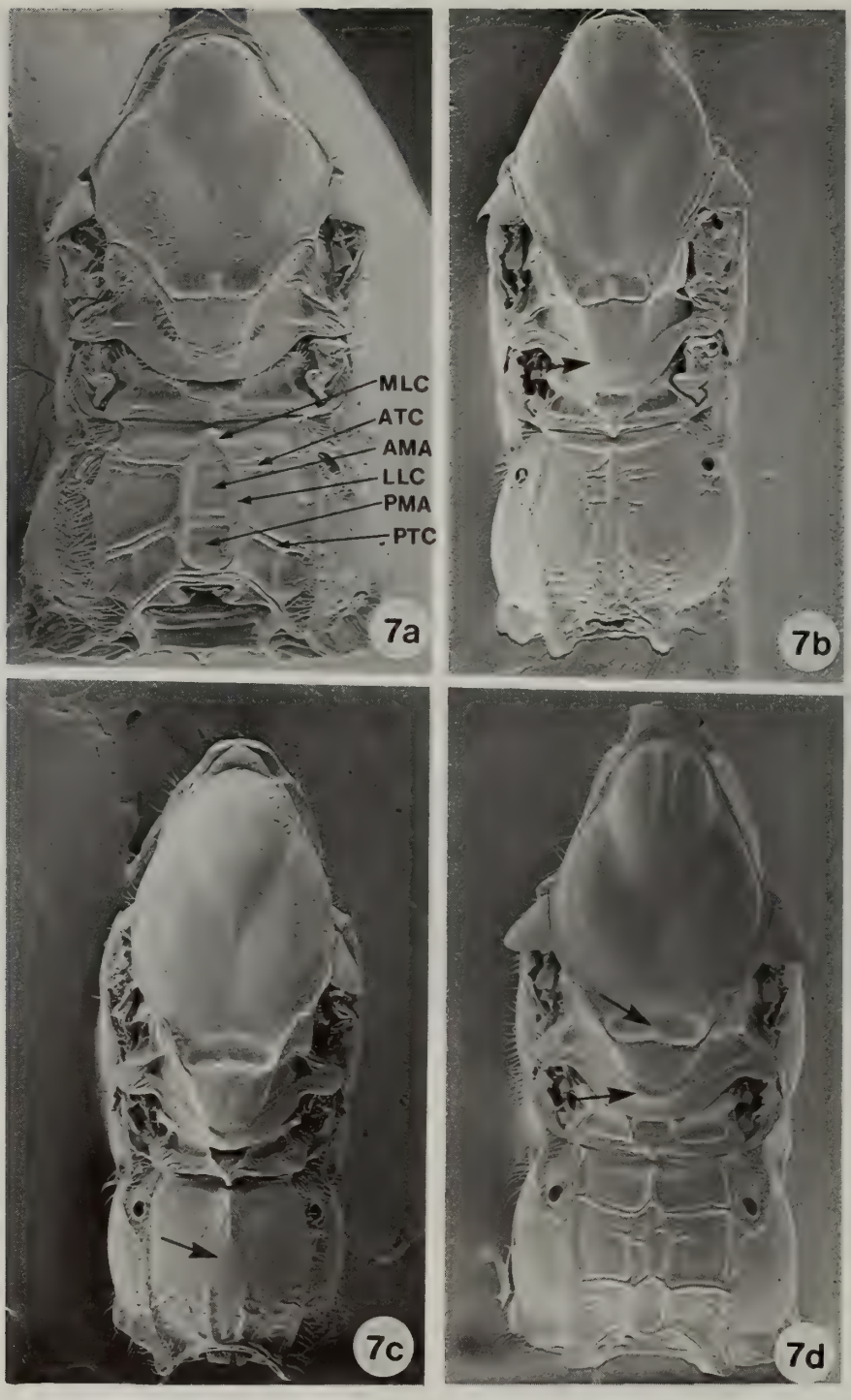


Figs 6a–f *Alabagrus* species. a, *xolotl*, lateral mesosoma; b, *stigma*, lateral mesosoma; c, *uchuk*, lateral mesosoma; d, *tripartitus*, lateral mesosoma; e, *tripartitus*, dorsal propodeum; f, *erythromelas*, dorsal propodeum.

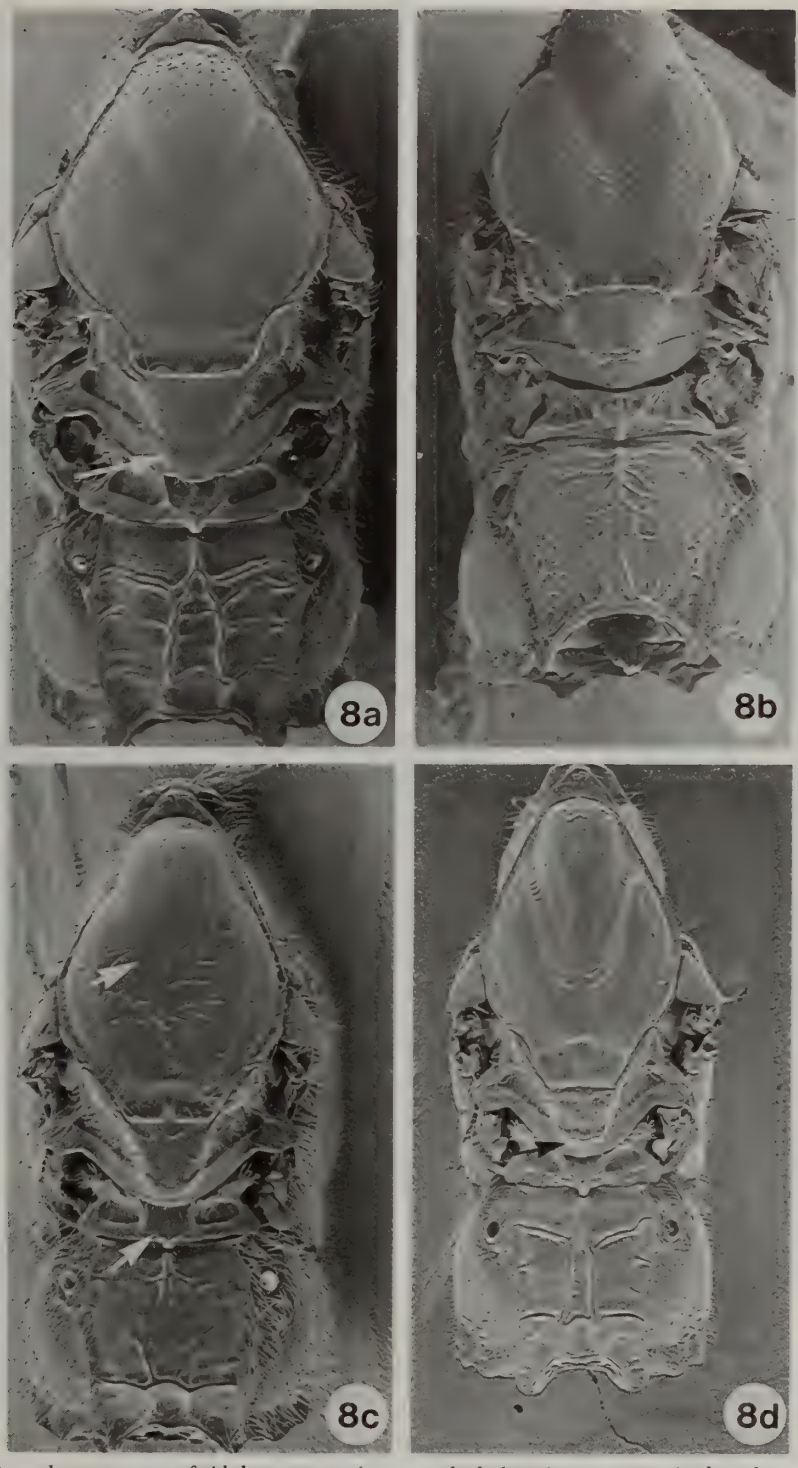
and posteriorly. This is the hypothesized plesiomorphic state; it is the most widespread condition in the Agathidinae and is common throughout the Braconidae. The areola is sometimes reduced or completely absent in members of *Alabagrus* (Fig. 8c). Species of *Pharpa* have a rather weak median areola, though the lateral margins are clearly present.

Sternaulus (Figs 5a, c–f)
The sternaulus is present and foveolate in many ichneumonoids including most Agathidinae. The sternaulus varies from being absent to complete, extending from the posterior border of the mesopleuron to the epicnemium (Fig. 1f). Most agathidines, including *Pharpa*, have a sternaulus intermediate in length, usually about 0·5 × the length of the mesopleuron (Fig. 5c). Consequently, this state is considered plesiomorphic for *Alabagrus*.

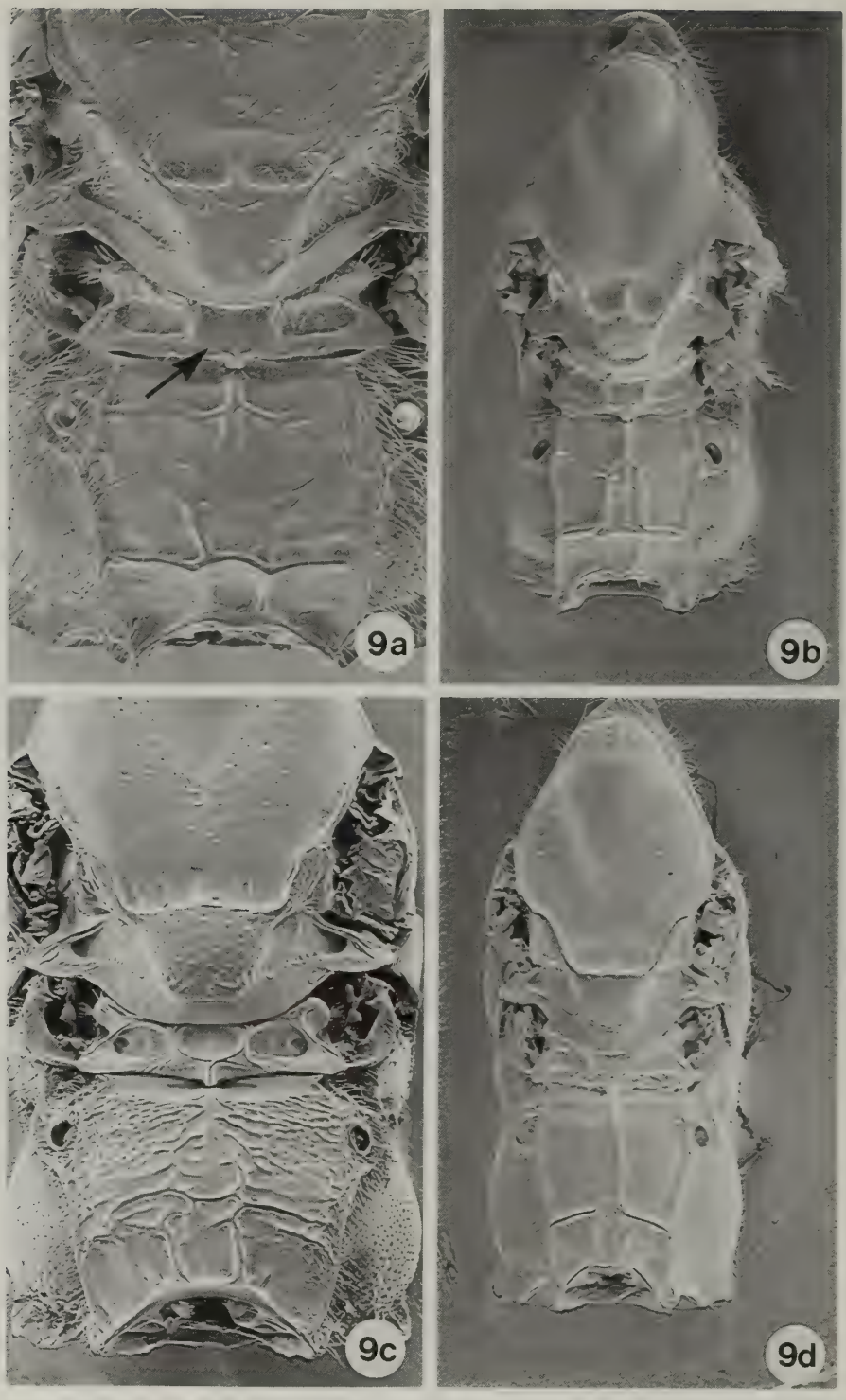
Longitudinal carinae between metepimeron and metepisternum (Figs 4a–f, 5d)
The presence of these carinae is plesiomorphic for *Alabagrus*; they are present in *Pharpa* and in most agathidine genera. In *Alabagrus*, they may be reduced (Fig. 5d) or absent (Fig. 4f).



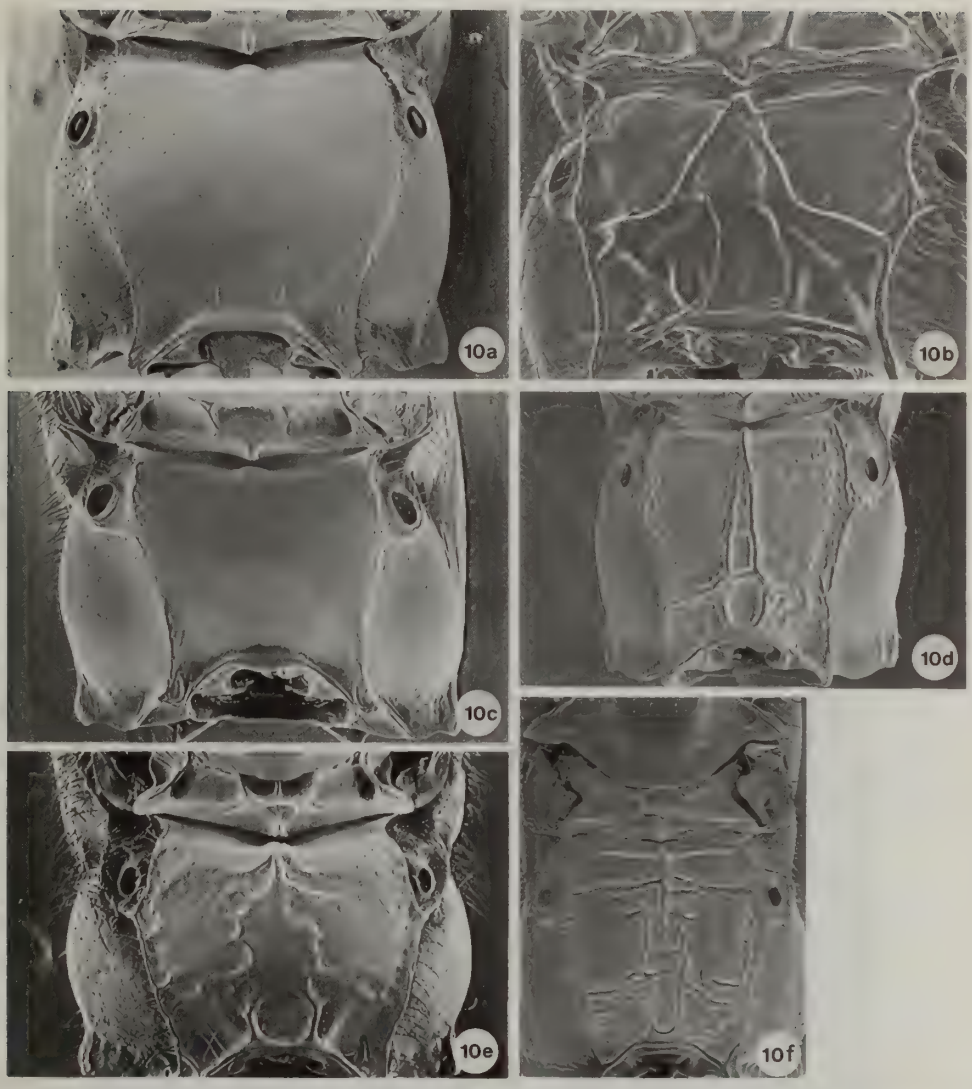
Figs 7a–d Dorsal mesosoma of *Alabagrus* species. a, *latisoma*: MLC = median longitudinal carina, ATC = anterior transverse carina, AMA = anterior median areola, LLC = lateral longitudinal carina, PMA = posterior median areola, PTC = posterior transverse carina; b, *imitatus*; c, *masneri*; d, *nigrilitus*.



Figs 8a–d Dorsal mesosoma of *Alabagrus* species. a, *uchuk*; b, *stigma*; c, *versicolor*; d, *arawak*.



Figs 9a–d Dorsal mesosoma of *Alabagrus* species. a, *vercicolor*; b, *elatoscutum*; c, *stigma*; d, *arawak*.



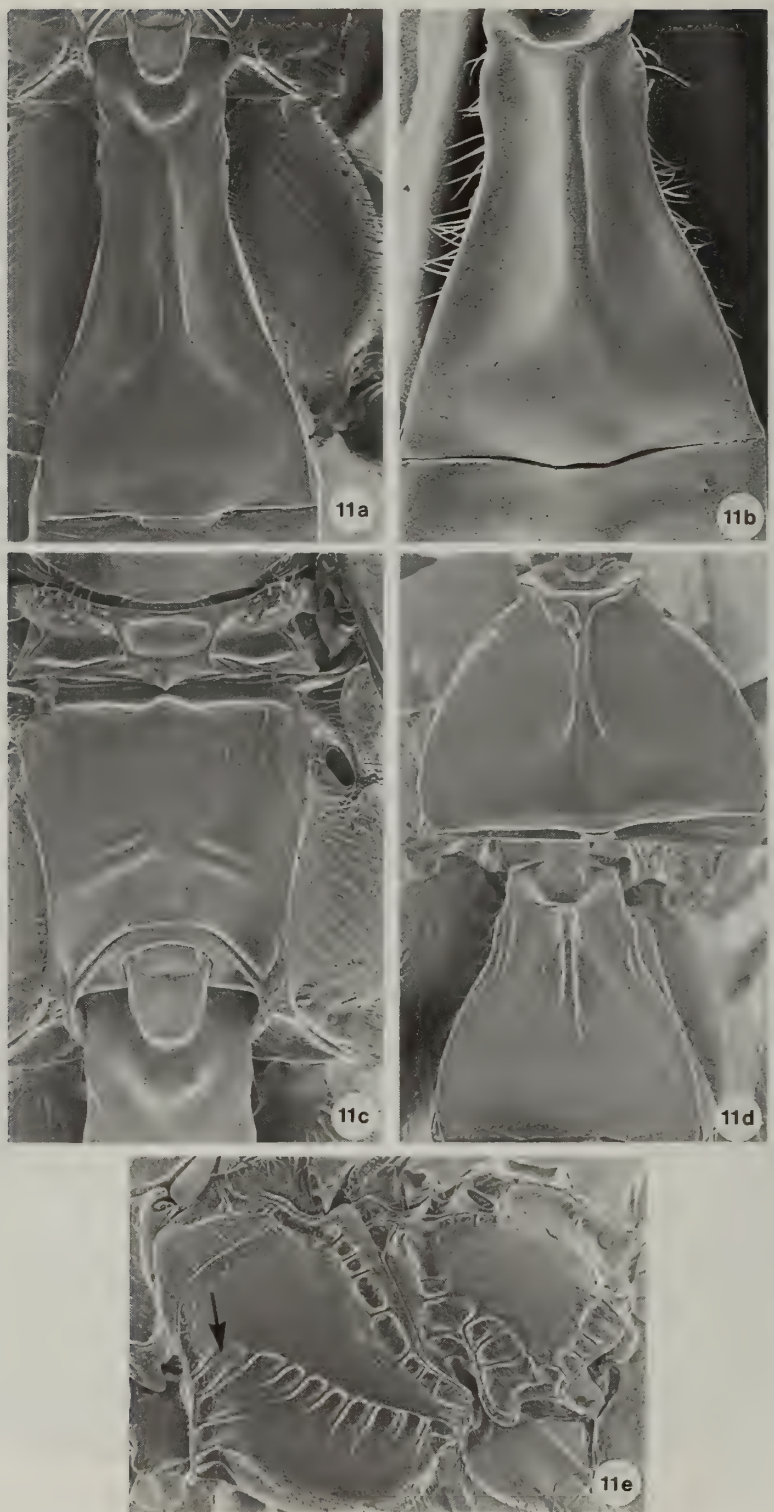
Figs 10a–f Propodeum of *Alabagrus* species. a, *kiska*; b, *wachupa*; c, *pachamama*; d, *triangulifer* ♂; e, *uchuk*; f, *sanctus*.

Metapleural sculpture (Fig. 4a–f)
The sculpture of the metapleuron varies from almost completely areolate rugose to smooth with scattered punctures. A few species including *A. stigma* have the metapleuron densely punctate. *Pharpa* has scattered weak punctures and a few rugae ventrally on the metapleuron. This is also the most widespread state in the Agathidinae and it is therefore considered to be plesiomorphic for *Alabagrus*.

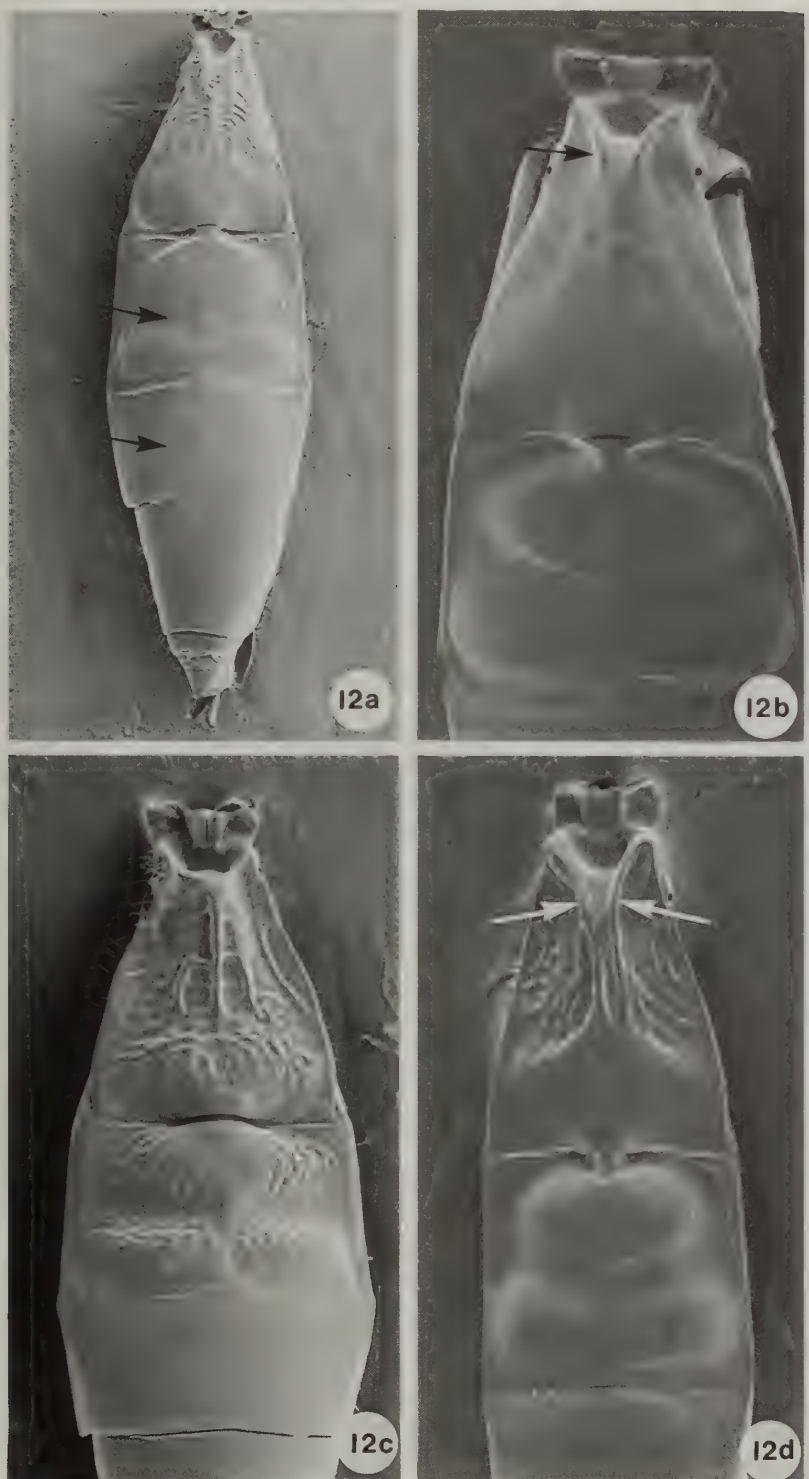
Propodeal sculpture (Figs 7a–10f)
An areolated propodeum is the ground-plan state for *Alabagrus*. This is the condition present in *Pharpa*, most genera of Agathidinae, and many other braconids and ichenumonids. In the ground-plan there are four major carinae, two longitudinal and two transverse, with the longitudinal carina fusing anteriorly. These carinae are named and labelled in Fig. 7a.

Propodeal sculpture varies considerably in *Alabagrus* and it is one of the most important characters for species recognition. The sculpture is often reduced (Figs 7b, d), and all conceivable intermediates between completely areolate (Fig. 7a) and completely smooth (Fig. 10c) are present.

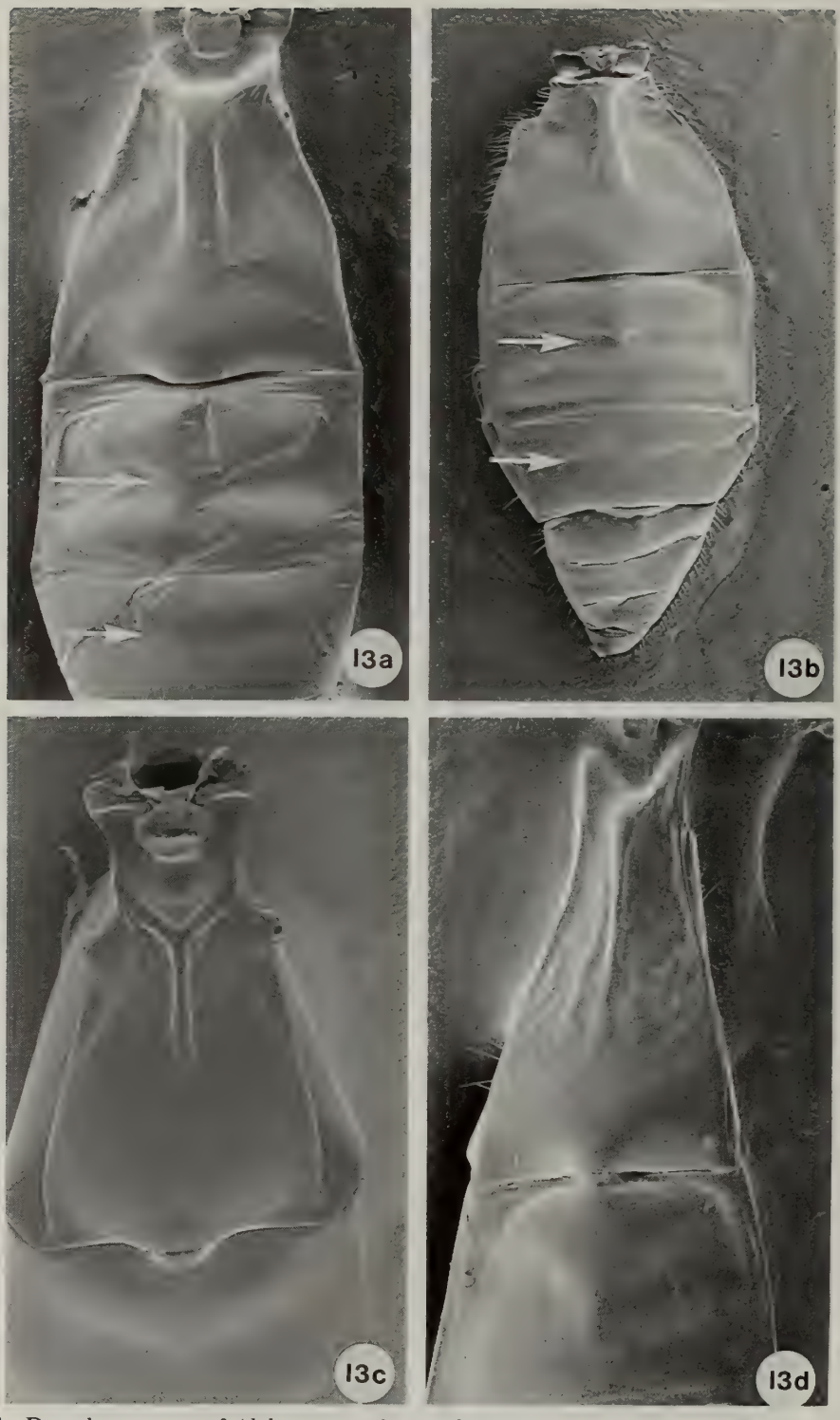
The sculpture of the propodeum is often (70%) a sexually dimorphic character. In species where the



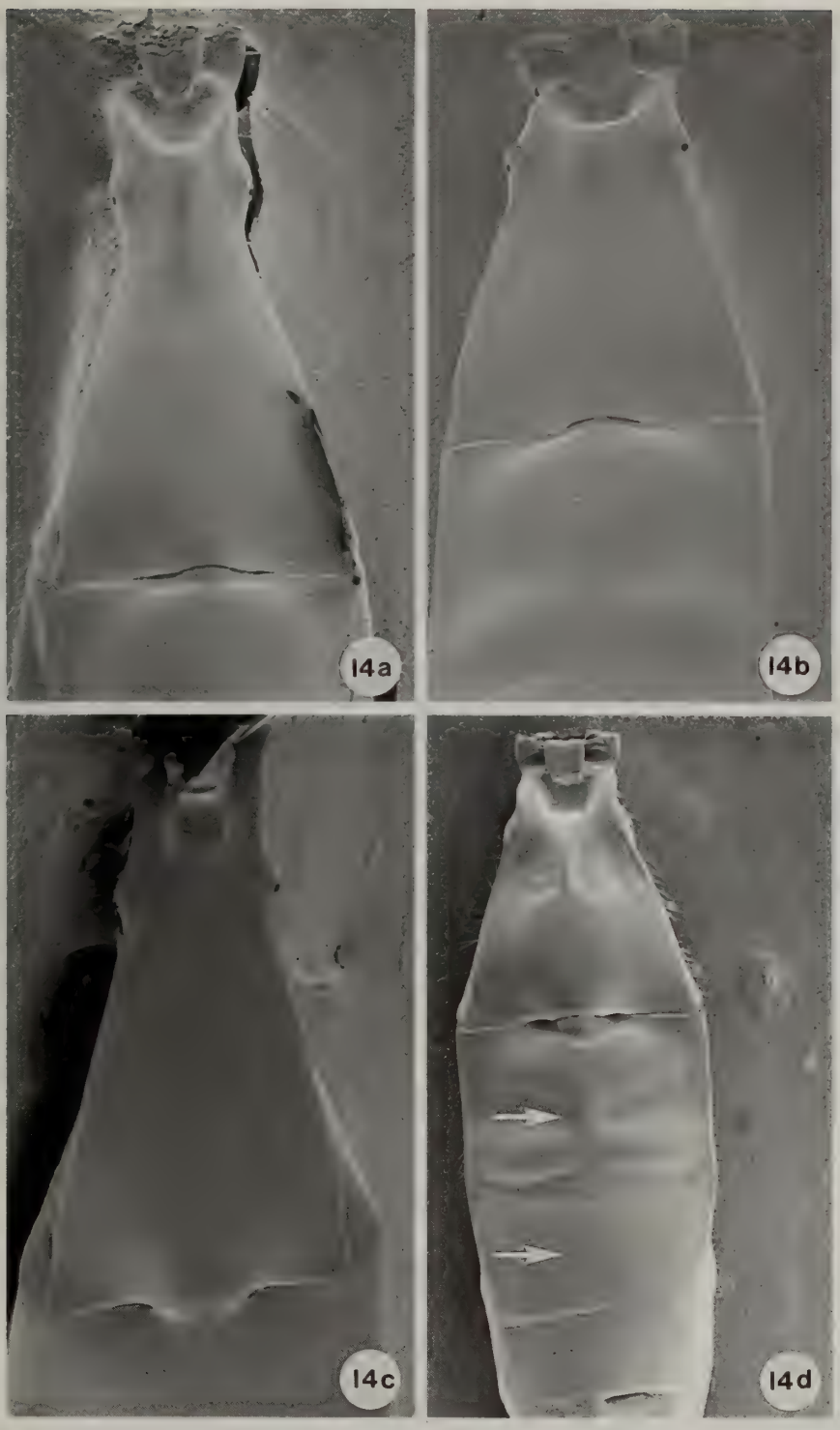
Figs 11a–f *Alabagrus* species. a, *janzeni*, dorsal metasomal tergum 1; b, *tripartitus*, dorsal metasomal tergum 1; c, *janzeni*, propodeum; d, *wachapu*, dorsal metasomal tergum 1; e, *voto*, dorsal metasomal tergum 1; f, *ekchuah*, lateral mesosoma.



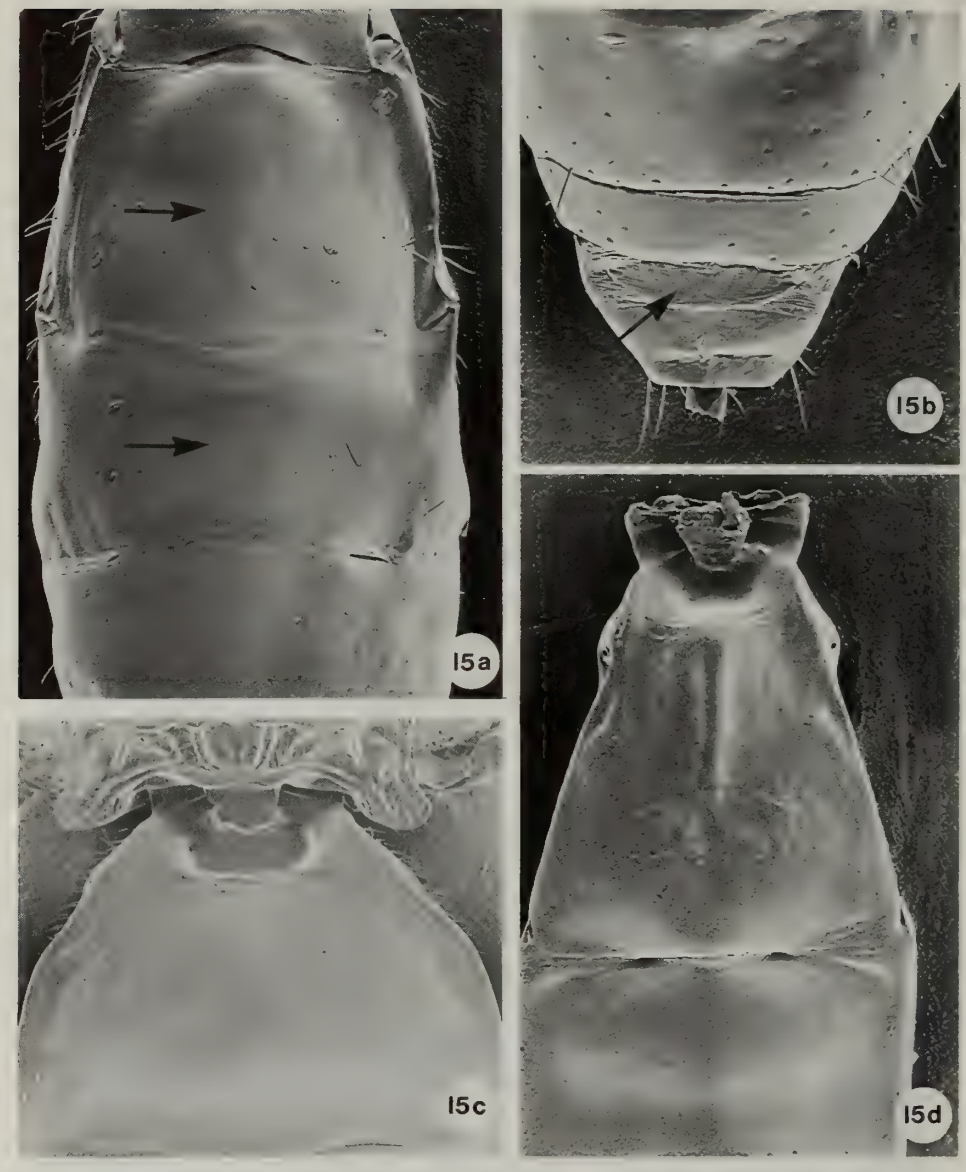
Figs 12a–d Dorsal metasoma of *Alabagrus* species. a, *stigma*; b, *parvifasciatus* ♀; c, *texanus*; d, *parvifasciatus* ♂.



Figs 13a–d Dorsal metasoma of *Alabagrus* species. a, *elatoscutum*; b, *latisoma*; c, *imitatus*; d, *arawak*.



Figs 14a–d Dorsal metasoma of *Alabagrus* species. a, *arawak*; b, *nigrilitus*; c, *xolotl*; d, *versicolor*.



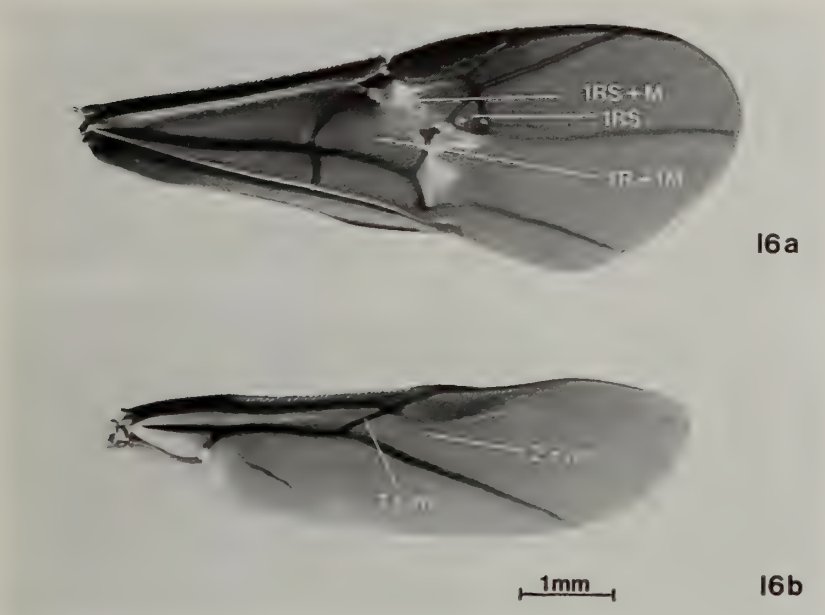
Figs 15a–d Dorsal metasoma of *Alabagrus* species. a, b, *uchuk*; c, *nicoya*; d, *nigrilitus*.

female has some reduction in the amount of propodeal sculpture the male often maintains a complete complement of carinae, the primitive character state. Even where females have the primitive state the males usually have stronger sculpture.

Spines of the mid tibia (Fig. 3d)

All agathidine genera have apical spines outwardly on the mid tibia. A group of genera (*Agathis* group) including *Bassus*, *Agathis* Latreille, *Braunsia* Kriechbaumer, *Pharpa* and *Alabagrus* also have spines that occur preapically. These are roughly defined as spines that are well separated from the apical row or cluster of spines (Fig. 3d).

The number of apical spines is rather consistent in *Alabagrus*, from three to six. The number of preapical spines is more variable interspecifically, from zero to over 30. Species of *Pharpa* have from one to three preapical spines. A low number of spines is also the most widespread state with the *Agathis* group of



Figs 16a, b *Alabagrus texanus*. a, fore wing; b, hind wing.

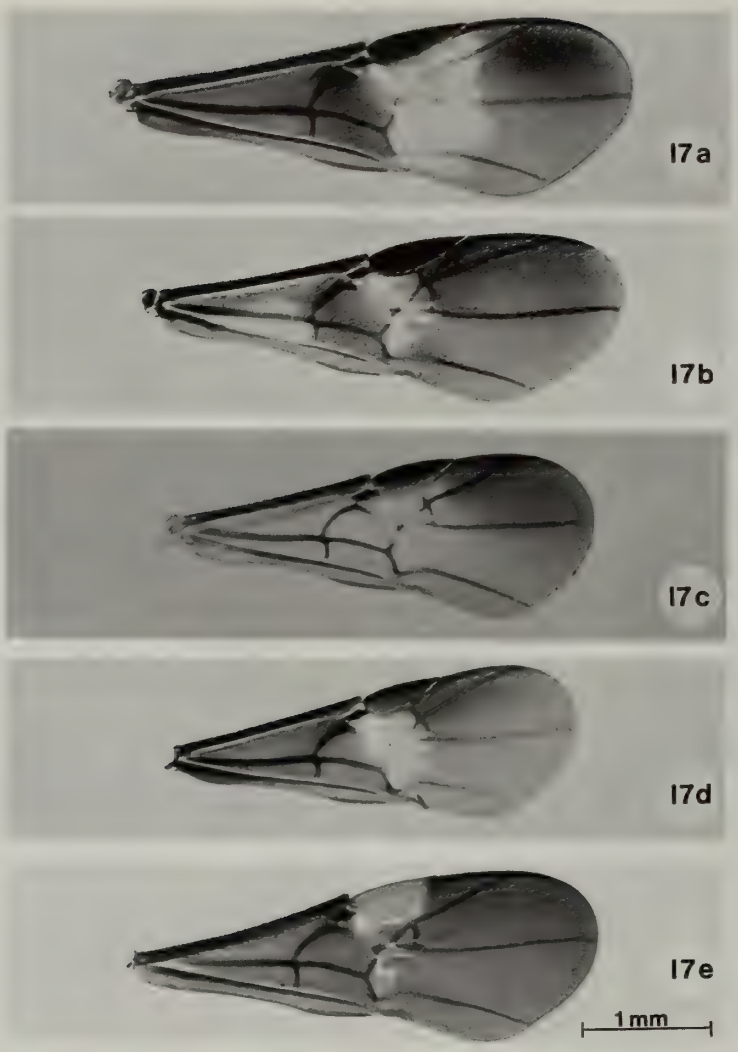
genera, but because of high intraspecific variability and the lack of an objective method to define character states in this continuous character, it was excluded from the phylogenetic analyses. The number of preapical spines varies considerably intraspecifically and variability increases as a function of the number of spines. Species typically have ranges as follows: 0–2, 1–3, 2–4, 3–6, 4–7, 6–11.

Apical spines on hind tibia (Fig. 3f)
This includes all spines on the hind tibia, though rarely some may be remote from the apex. These spines are present in members of all agathidine genera. Members of the genus *Pharpa* have between five and seven spines and this is also the most common range in the *Agathis* group of genera. In *Alabagrus* the number of spines varies from three to 20. As with mid tibia preapical spines, there is some intraspecific variation in this character. The number of spines on the hind tibia is positively correlated with the number on the mid tibia.

Sculpture of the hind leg ventrally (Figs 3a, b, c, e)
There are three states of this character in *Alabagrus*: smooth with scattered weak punctures (Figs 3b, e), strongly punctate (Fig. 3a), and rugose (Fig. 3c). The first is considered the primitive state, is the only one occurring in the sister group *Pharpa* and is the most widespread in the Agathidinae. The other two states occur in other Agathidine genera but not commonly. These states occur convergently and sporadically in *Cremnops* and allies, and in *Zelomorpha* and allies, both of which are distantly related to *Alabagrus*.

Dimensions of hind femur (length/width) (Fig. 3e)
The hind femur varies in size from 2·7–5·1 × longer than wide in *Alabagrus*. Members of *Pharpa* have hind femora varying from 3·5–4·3 × longer than wide and the vast majority of agathidines in the *Agathis* group fall in this range. There is some intraspecific variation in this character. Hind femora of females vary by 0·1 or 0·2 × and femora of males are usually slightly wider than those of females. This ratio is very useful to distinguish species, and several monophyletic groups in *Alabagrus* have unusually stout hind femora. The measurements are taken in lateral view from the apex of the trochantellus to the apex of the femur.

Wing venation characters (Fig. 16)
Wing venation is very consistent in *Alabagrus*. The 1*RS* cell is usually triangular and sessile. It is never widely quadrate nor greatly petiolate. In some species the 1*RS* cell may be weakly quadrate but this seems to be variable intraspecifically.



Figs 17a–e Fore wing of *Alabagrus* species. a, *mataco*; b, *arawak*; c, *maculipes*; d, *uchuk*; e, *guayaki*.

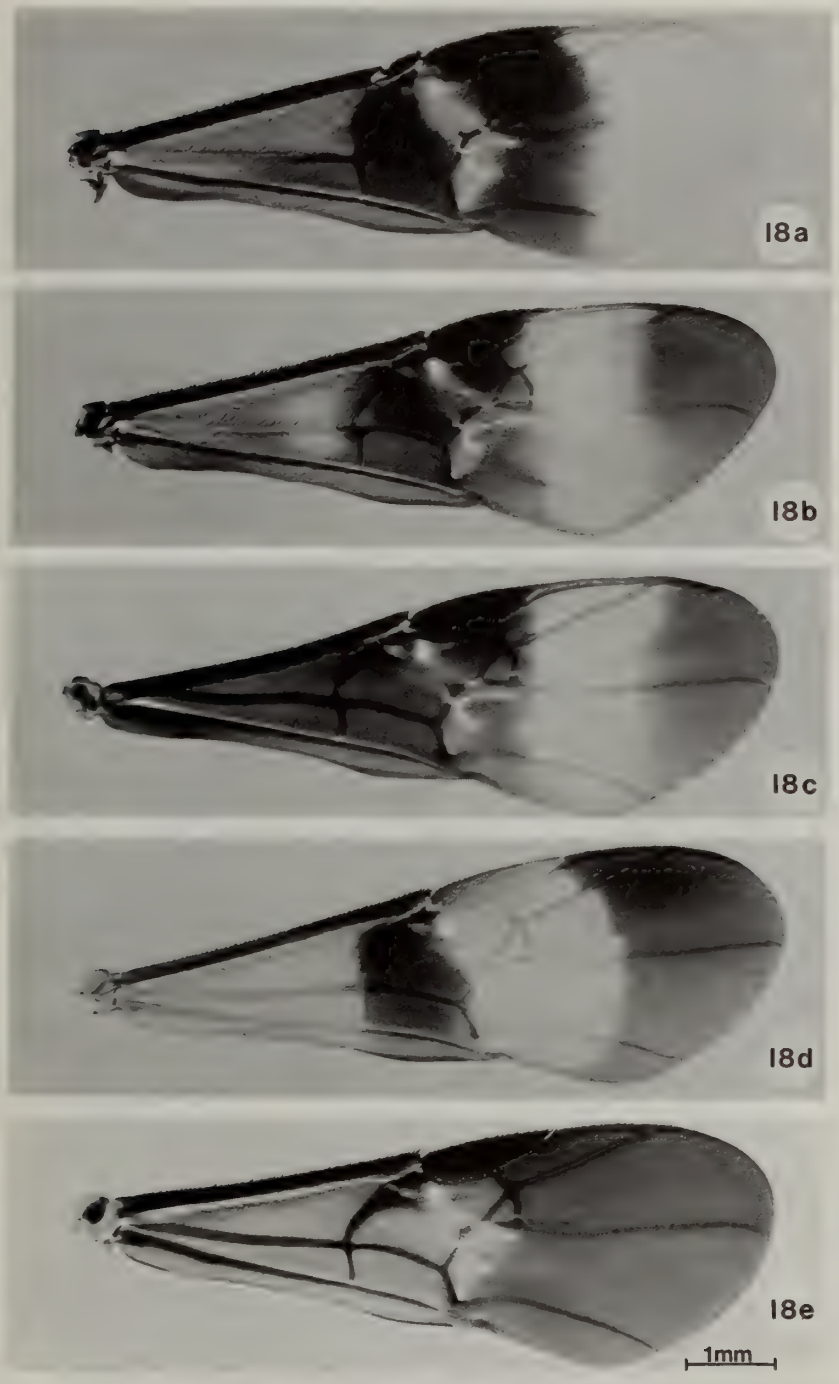
There is sometimes a remnant of $2RS_2$ of the fore wing present as a stub or swelling in $2r{-}m$; however, this is variable and not a reliable character at the species level in *Alabagrus*.

Sculpture of the 1st metasomal tergum

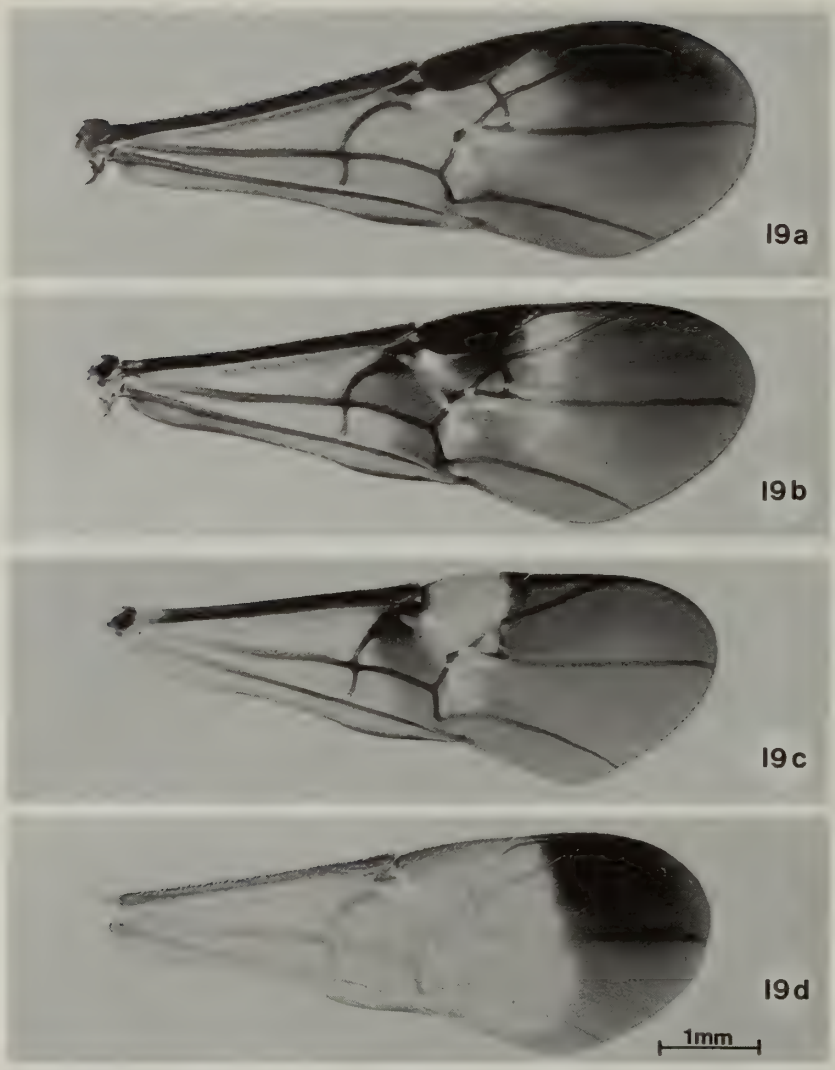
Primitively, the Agathidinae have two parallel longitudinal carinae on the first tergum. This state is found in numerous taxa in the Agathidinae, e.g. *Braunsia*, *Bassus*, and *Pharpa*. Similar though weaker carinae are on the first tergum of species of *Agathis* and *Earinus* Wesmael. This condition is very widespread in the Braconidae and the Ichneumonidae and may be the ground-plan state for the entire superfamily.

In *Alabagrus*, two carinae on the first tergum (the plesiomorphic condition) are found in males of *A. parvifasciatus* and some males of *A. stigma*. Most female *Alabagrus* lack two carinae but when present they converge to form a medial longitudinal carina (Figs 13a–d) or are very short (Fig. 12b). Short converging carinae, found in females of *A. parvifasciatus*, are the presumed ground-plan character state for *Alabagrus* females.

The *miqa* species-group is defined by the strong median carina formed by the fusion of the two lateral longitudinal carinae. The shape of the carina and/or median bump on the first metasomal tergum are important diagnostic characters.



Figs 18a–e Fore wing of *Alabagrus* species. a, b, *tripartitus*; c, *tricarinatus*; d, *mojos*; e, *albispina*.



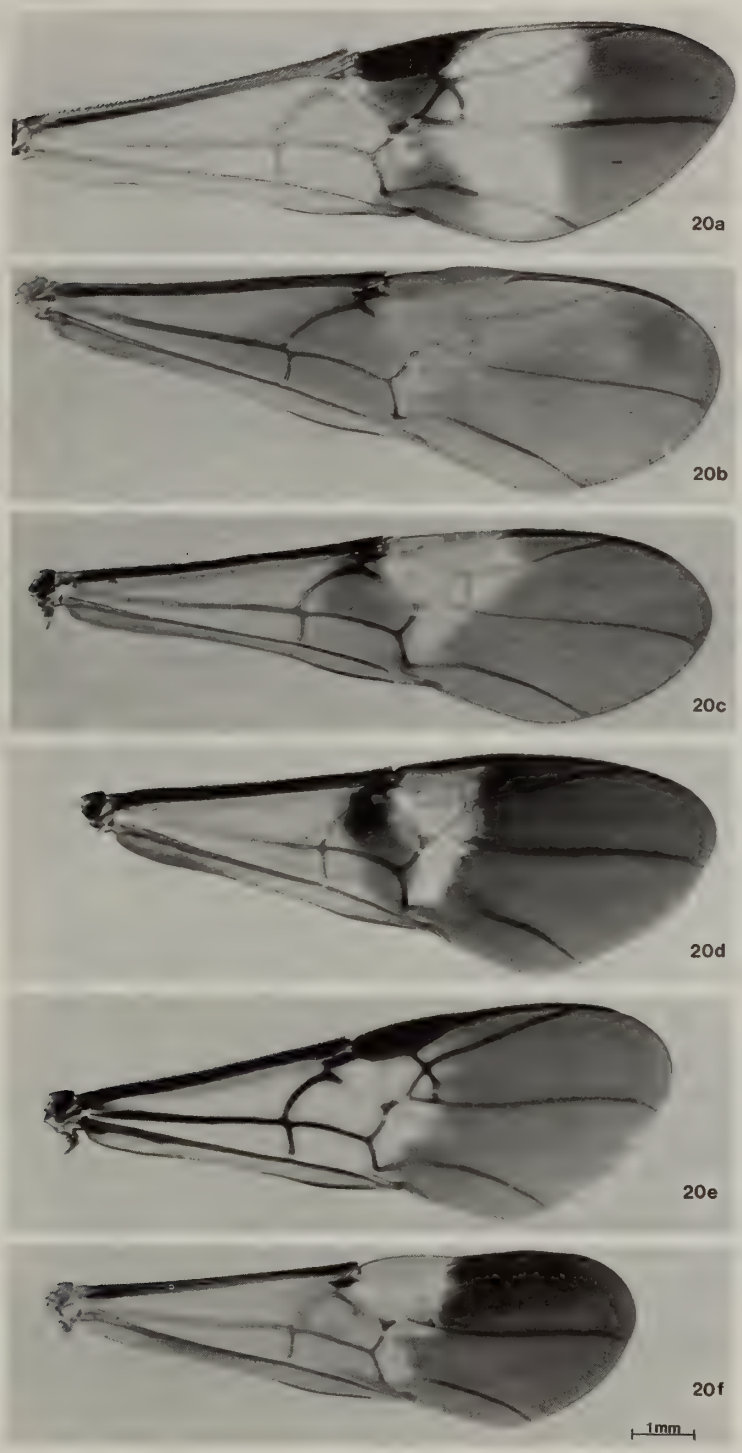
Figs 19a–d Fore wing of *Alabagrus* species. a, *masoni*; b, *parusimi*; c, *versicolor*; d, *cara*.

Dimensions of the first metasomal tergum (Figs 11–15)
The length/width ratio of the first metasomal tergum varies between 0·7 and 2·0 in *Alabagrus*. In *Pharpa* the ratio varies between 1·0 and 1·1. In the Agathidinae ratios between 1·0 and 1·5 are common and widespread, therefore I define as plesiomorphic in *Alabagrus* length/width ratios between 1·0 and 1·5.

It is important to measure the first metasomal tergum uniformly, as described in the methods section.

The length/width ratio is also given in the species descriptions for the fused second and third terga. The ratios are usually nearly equal to the ratio of the dimensions of the first tergum, varying by 0·1 or 0·2.

Transverse depressions on metasomal terga two and three (Figs 12c, 13b, 15a)
The presence of a transverse depression on both terga two and three is plesiomorphic for *Alabagrus*. The depressions are well impressed in all species of *Pharpa* and in many other closely related agathidine genera, e.g. *Neomicrodus* Szépligeti, *Braunsia* and some *Bassus*. Weakly impressed transverse depressions are found on the first and second metasomal terga of some *Agathirsia* Westwood and *Earinus*. In these genera, and in all *Agathis* investigated, the transverse depression of the third tergum is usually weak or lost while that of the second tergum is retained. This same reduction has occurred independently in many genera, including *Alabagrus*.



Figs 20a–f Fore wing of *Alabagrus* species. a, *latreillei*; b, c, *kiska*; d, *kagaba*; e, *nahuatl*; f, *stigma*.

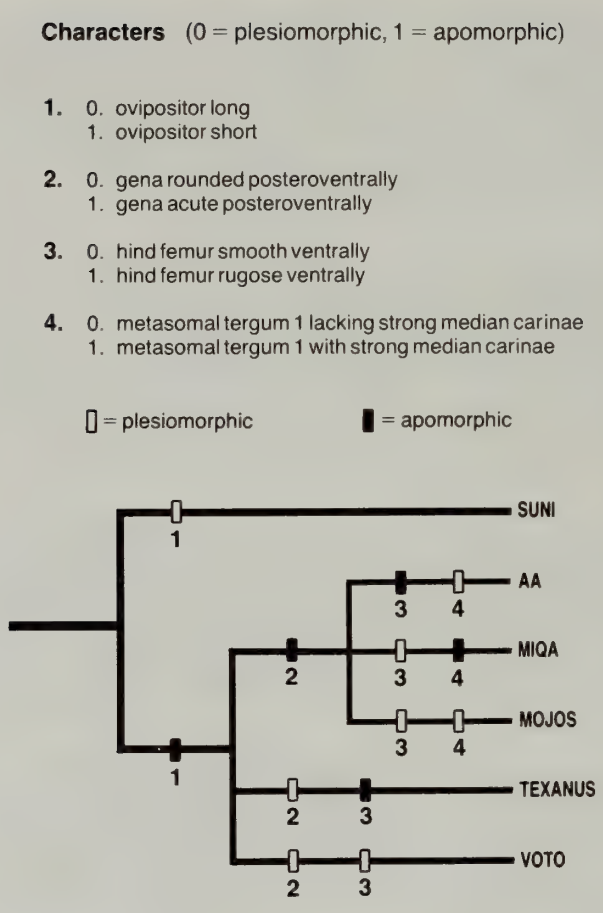


Fig. 21 Hypothesis of phylogenetic relationships of species groups of *Alabagrus*.

Length of the ovipositor

Ovipositor length varies from 0·4–1·6 × the body length in *Alabagrus*. In *Pharpa* this ratio varies from 1·0–1·1. Among the *Agathis* group of genera an ovipositor about equal to the length of the body is the most widely distributed, although short and long ovipositors occur rarely.

The length of the ovipositor is usually quite consistent intraspecifically. In *Alabagrus texanus* the ratio of ovipositor length to body length varies from 0·7–1·0. This rather wide range is due primarily to a few aberrant individuals. One species, *A. triangulifer*, has a variable ovipositor length (0·8–1·3) but it is an exceptional species in that almost every character seems to vary considerably. I am not at all certain that it represents only one species.

The entire length of the ovipositor is measured when comparing its length with that of the body. Rarely the ovipositor is extended and then this measurement is not difficult to make. When the ovipositor is not extended a close approximation to its length can be obtained by measuring the ovipositor from the base of the hypopygium.

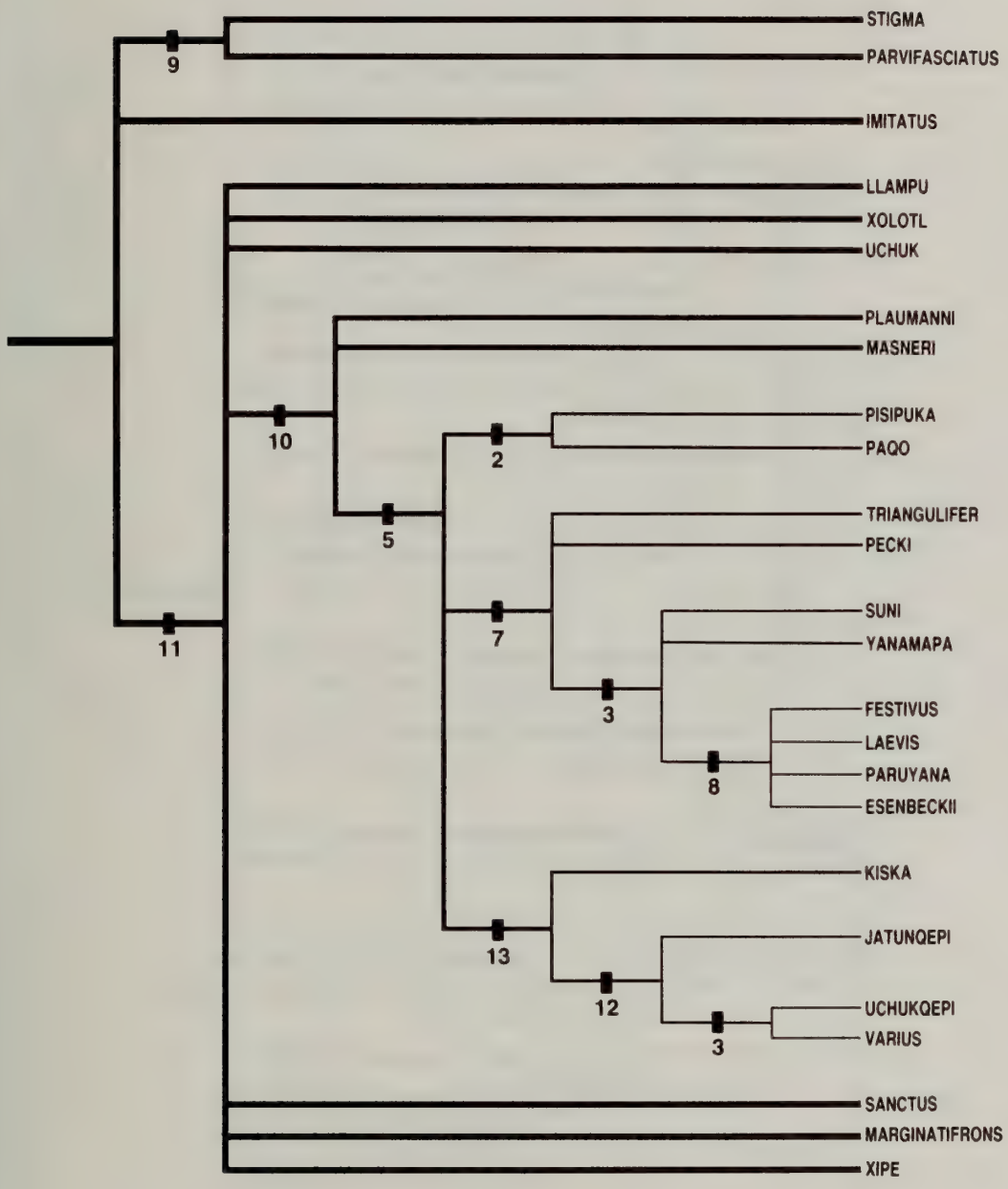


Fig. 22 Hypothesis of phylogenetic relationships of species of the *suni*-group.

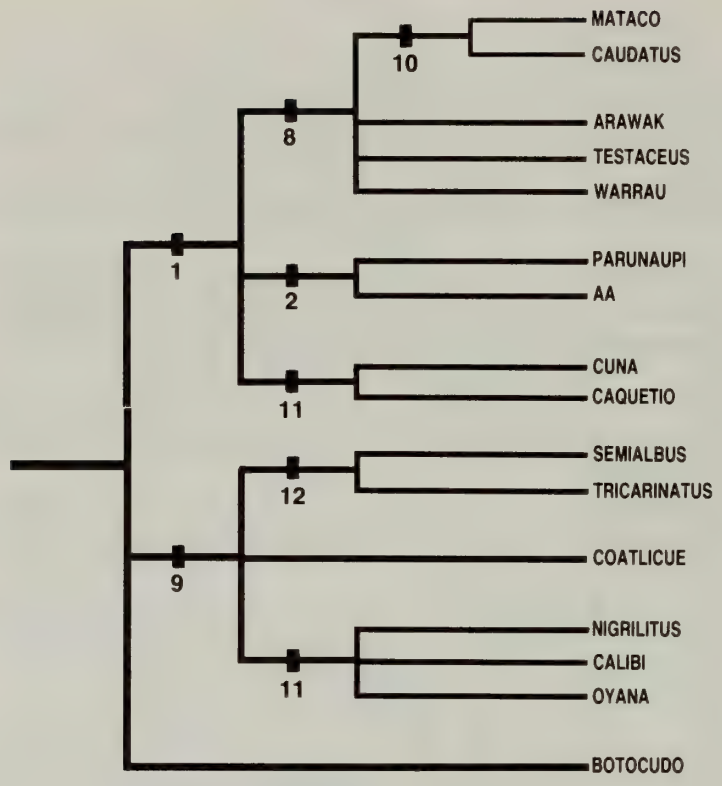


Fig. 23 Hypothesis of phylogenetic relationships of species of the *aa*-group.

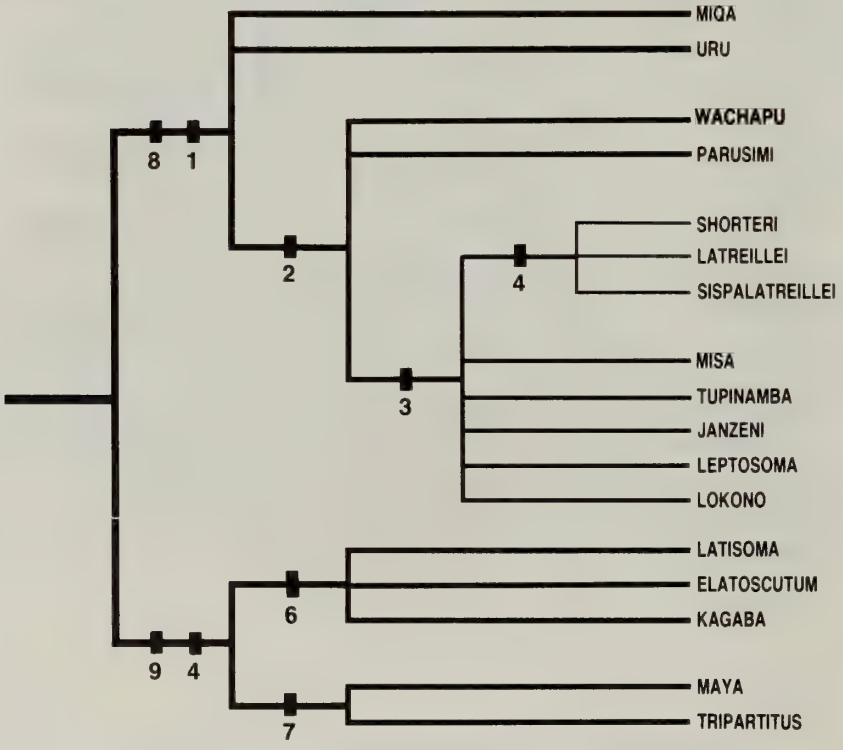


Fig. 24 Hypothesis of phylogenetic relationships of species of the *miqa*-group.

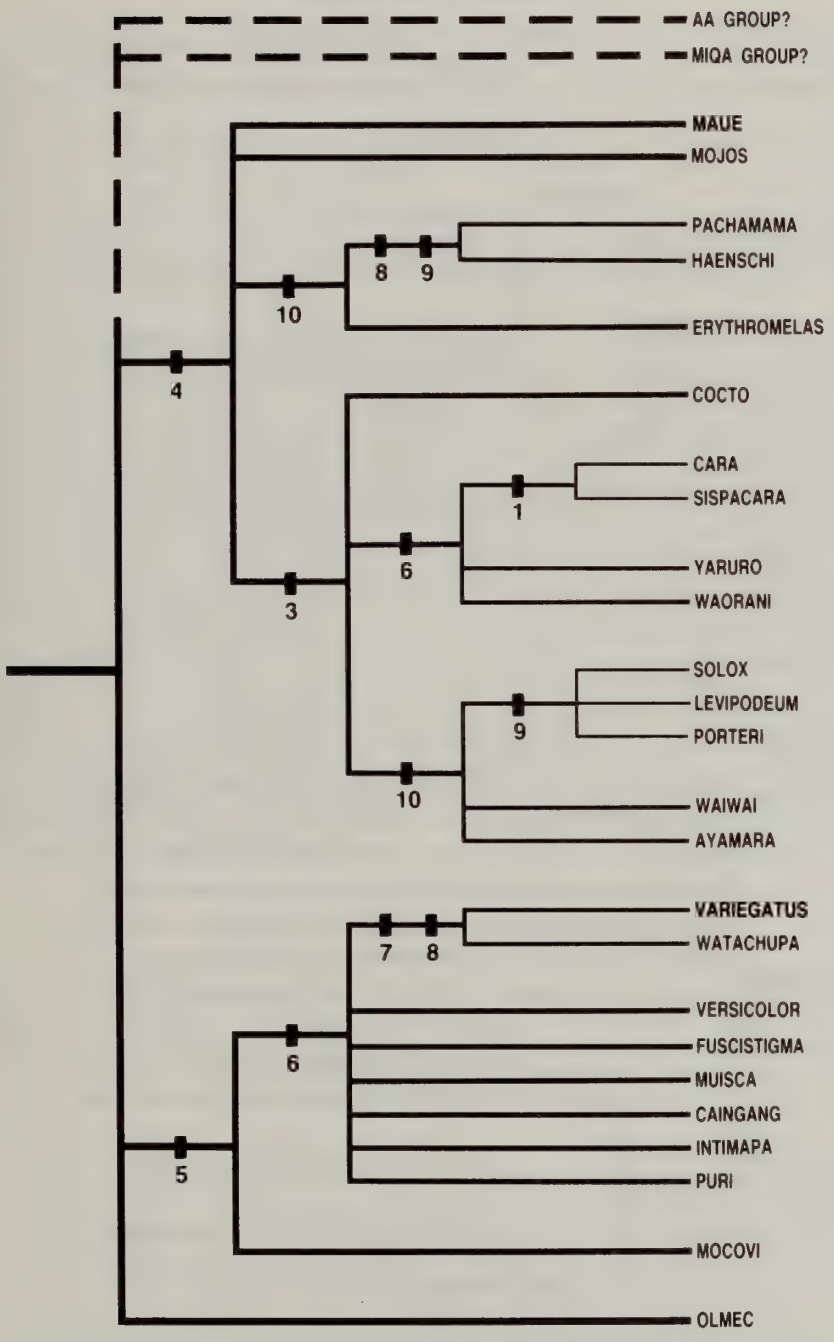


Fig. 25 Hypothesis of phylogenetic relationships of species of the *mojos*-group.

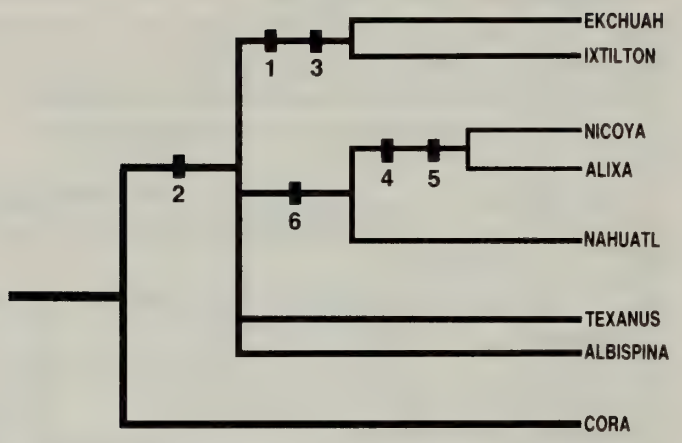


Fig. 26 Hypothesis of phylogenetic relationships of species of the *texanus*-group.

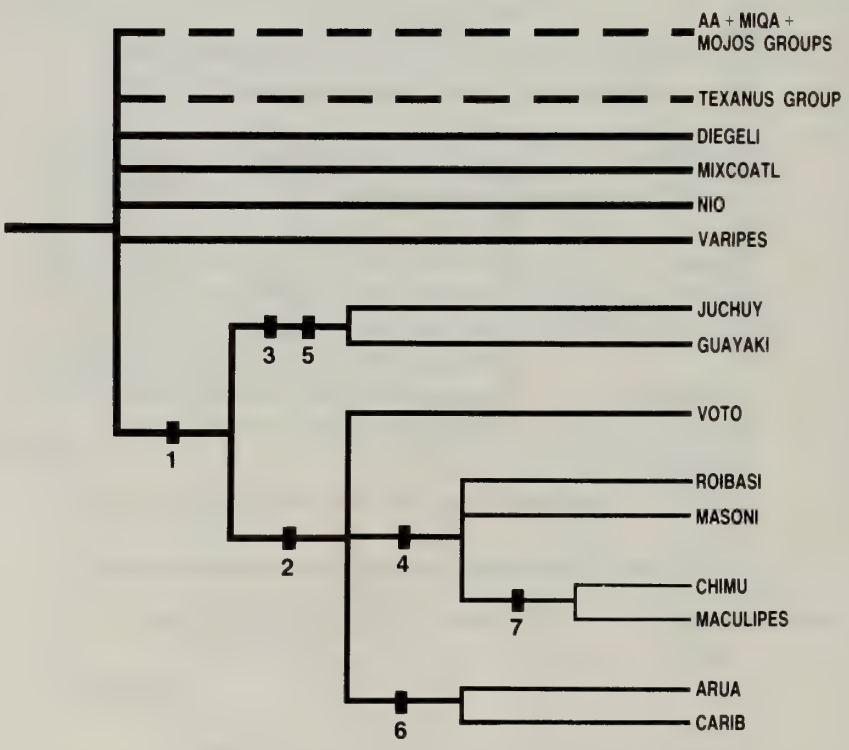


Fig. 27 Hypothesis of phylogenetic relationships of species of the *voto*-group.

ALABAGRUS Enderlein

Alabagrus Enderlein, 1920: 203. Type species: *Alabagrus citreistigma*, Enderlein, by original designation.
Astiria Enderlein, 1920: 207. Type species: *Astiria haenschi* Enderlein, by original designation. **Syn. n.**
Craspedobothrus Enderlein, 1920: 206. Type species: *Craspedobothrus fuscovittatus* Enderlein, by original designation. **Syn. n.**
Liyptia Enderlein, 1920: 210. Type species: *Liyptia rufiventris* Enderlein, by original designation. **Syn. n.**

GENDER. Masculine.

DIAGNOSIS. Members of *Alabagrus* may be distinguished from all other agathidines by the following combination of character states: frons bordered by carinae (Fig. 1a); tarsal claws with rounded basal lobe (Fig. 3g); first metasomal tergum convex and often with median longitudinal carina (Figs 13–14), rarely (2%) two carinae present (Figs 12b, d).

DESCRIPTION. *Head.* Number of flagellomeres 35–65, usually 40–50; maxillary palpus 5segmented; labial palpus 4-segmented, 3rd segment of labial palpus relatively small and sometimes difficult to see; gena expanded posteroventrally, rounded or acute (Figs 2a, f); frons margined with carinae (Fig. 1a); rarely (3%) occiput excavated medially (Fig. 1b), usually unexcavated (Fig. 1d). *Mesosoma.* Notauli usually (85%) impressed, rarely reduced or absent, never foveolate; scutellum usually (80%) with posterior transverse ridge (Fig. 8d); sculpture of propodeum variable, usually areolate (70%) (Fig. 7d) but ranging from smooth (Fig. 10c) to rugose (Fig. 8b): hind coxal cavities closed (Fig. 1c); sternaulus usually foveolate, about 0·5 × length of mesopleuron, varying from completely absent to foveolate for entire length of mesopleuron (Fig. 11f); 1*RS* cell of fore wing usually sessile and triangular (Fig. 16), rarely (4%) weakly petiolate or subquadrate (Fig. 18c); $2RS_2$ indicated as small bump or bend in 2*r–m*; 1*RS* + *M* absent, making cells 1*M* and 1*R* confluent (Fig. 20e); 2*r–m* of hind wing usually indicated by spectral vein (see Mason, 1986 for definition) in anterior 0·3; mid tibia with preapical spines (Fig. 3d); mid and hind tibia with apical spines (Figs 3d, 3f); tarsal claws of all legs with rounded basal lobe (Fig. 3g). *Metasoma.* First metasomal tergum usually (70%) smooth and convex (Fig. 14a), often with median carina (Fig. 13a), rarely (2%) two longitudinal carinae present (Figs 12b, d); 2nd and 3rd terga usually smooth; 2nd tergum usually (95%) with and 3rd tergum usually (75%) without transverse depression, but both may lack or possess transverse depression (Figs 12c, 13b, 15a); 8th metasomal tergum of females (9th abdominal) mostly membranous and excavated anteromedially (Fig. 15b); 7th metasomal sternum of males (8th abdominal) notched posteromedially (Fig. 1e); ovipositor from as long as metasoma to almost 2 × body length.

Length. 4·5–14·0 mm not including ovipositor.

Phylogeny

Methods

The approach used to hypothesize phylogenetic relationships is most often referred to as the cladistic method, formulated by Hennig (1950, 1966) and more concisely explicated by Wiley (1981).

The polarity or relative age of character states (i.e. apomorphic = derived and plesiomorphic = ancestral) was determined using outgroup analysis (Watrous & Wheeler, 1981). When both states were found in the outgroup, that character state found in the hypothesized sister group, *Pharpa*, was considered plesiomorphic.

In constructing the cladograms of individual species groups I ran the character state distributional data (Tables 1–6) through PAUP (Phylogenetic Analysis Using Parsimony) (Swofford, 1985). This is a Fortran 77 program for inferring phylogenies using maximum parsimony. The data were run using the MULPARS option which allows one to view all equally parsimonious trees. This option was used in conjunction with a swapping procedure 'Global Swapping' that rearranges the topologies in search of shorter trees.

All of the shortest trees from any one species group were then input into another Fortran program developed by Swofford (1985) called CONTREE. This finds the strict concensus tree (Nelson, 1979), a tree that presents the information common to the entire set of equally parsimonious trees. In most species groups there was such poor congruence in characters that more than 100 equally parsimonious trees were found. However, PAUP only stores the first 100 trees found; thus, when the CONTREE program was run with the 100 trees supplied, it was operating with an incomplete data set, but even so the concensus trees gave almost no information. It was clear that the use of strict parsimony could resolve very few clades in any of the species groups.

I repeatedly searched for more characters to include in my character matrices but all available were either autapomorphies or they were difficult to code objectively because they were continuous characters.

To obtain some resolution in the cladograms (Figs 21–22) it was necessary to weight some characters.

Table 1. Character matrix of species of the Suni species group. (P = intermediate or polymorphic)

CHARACTERS	STIG	IMIT	PARV	FEST	PARU	SUNI	YANA	PISI	TRIA	ESEN	PLAU	PAQO	LLAM	XIPE	XOLO	MARG	UCHUK	PECK	MASN	SANC	VARI	UCHUKQ	JATU	KISK	LAEV
1. Antennal color 0. concolorous with head 1. at least flagellum paler than head	P	0	0	0	0	0	0	0	1	0	0	1	P	0	0	0	0	0	0	0	0	0	1	1	0
2. Fore wing pattern 0. lacking yellow stigmal spot 1. with yellow stigmal spot (Figs. 17e, 20c)	P	0	P	0	0	0	0	1	1	0	1	1	1	0	0	0	P	0	0	0	0	0	1	1	0
3. Fore wing pattern 0. lacking 2 yellow bands 1. with 2 yellow bands (Fig. 20a)	0	0	0	1	1	1	1	0	0	1	0	0	0	0	0	0	0	0	0	0	1	1	0	0	1
4. Median ridge of scutum 0. present 1. absent	0	P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	1	1	1	1	1
5. Transverse ridge of scutellum 0. present 1. absent	0	0	0	1	1	1	1	P	P	1	0	1	0	1	0	0	P	1	0	0	1	1	1	1	1
6. Median areola of metanotum 0. well impressed 1. weak or absent	0	0	0	0	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7. Foveae of sternaulus 0. at least 0.4 X length of mesopleuron (Fig. 5c) 1. less than 0.4 X length of mesopleuron (Fig. 5f)	0	0	1	1	1	1	0	0	1	1	1	0	0	0	0	0	1	1	1	0	1	1	1	1	1
8. Border between metepisternum and metepimeron 0. with crenulae 1. lacking crenulae	0	0	0	1	1	0	0	0	0	1	0	0	0	0	0	0	1	0	0	0	1	1	1	0	1
9. Metapleural sculpture 0. punctures weak (Fig. 6d) 1. punctures strong (Fig. 6b)	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10. Propodeal sculpture (female) 0. areolate 1. areolae reduced or absent (Figs. 8b, 10a)	P	P	1	1	1	1	1	1	1	1	1	1	0	0	P	P	0	P	P	0	1	1	1	1	1
11. Sculpture of metasomal tergum 1 (males) 0. with 2 longitudinal carinae 1. lacking 2 longitudinal carinae	0	0	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
12. Face 0. smooth 1. bump laterad clypeus	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	0	0
13. Occiput 0. not deeply excavated (Fig. 1a) 1. deeply excavated (Fig. 1b)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	0

Table 2. Character matrix of species of the Aa species group. (P = intermediate or polymorphic)

CHARACTERS	COA	WAR	NIG	CUN	MAT	CAU	PAR	AA	SEM	TRI	CAL	BOT	OYA	TES	CAQ	ARA
1. Body color 0. partly melanic 1. entirely pale	0	1	0	1	1	P	1	1	0	0	0	0	1	1	1	P
2. Flagellum color 0. flagellomeres concolorous 1. several flagellomeres contrastingly yellow	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0
3. Head color 0. melanic 1. pale	0	1	0	0	0	0	0	0	0	0	0	0	1	0	0	0
4. Color of stigma 0. melanic 1. yellow	0	1	0	0	0	1	0	0	0	0	1	1	1	1	0	0
5. Base of fore wing 0. melanic 1. pale	0	1	0	0	0	1	0	0	0	0	P	0	0	0	0	0
6. Fore wing pattern 0. lacking single yellow band 1. with single yellow band (Fig. 17a)	0	0	0	0	1	0	1	1	1	1	0	0	0	0	0	0
7. Areolae of propodeum 0. anterior median areola less than 2 X longer than posterior median areola (Fig. 7a) 1. anterior median areola more than 2 X longer than posterior median areola (Fig. 8d)	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	1
8. Metasomal tergum 1 0. less than 1.5 X longer than wide 1. more than 1.5 X longer than wide	0	1	0	0	1	P	0	0	0	0	0	0	0	P	0	1
9. Metasomal tergum 1 0. more than 1.3 X longer than wide 1. less than 1.3 X longer than wide	1	0	1	P	0	0	0	0	1	1	1	0	1	0	P	0
10. Propodeal sculpture 0. strong anteriorly (Fig. 8d) 1. weak anteriorly (Fig. 8c)	0	1	0	0	1	1	0	0	0	0	0	0	0	0	0	0
11. Transverse ridge of scutellum 0. strong, acute (Fig. 8d) 1. weak or absent (Figs. 8a, c)	0	0	1	P	0	0	0	1	0	P	P	0	1	0	1	0
12. Fore wing pattern 0. lacking single clear band 1. with single clear band (Fig. 18c)	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0

This was done on the basis of character complexity (Hect & Edwards, 1977) and compatibility with other characters.

Monophyly of *Alabagrus* and its phylogenetic position in the Agathidinae

Alabagrus belongs to an informal group of genera referred to by Bhat & Gupta (1977) as the *Agathis* group. Sharkey (1985) expanded their concept of the *Agathis* group to include the following genera: *Aerophiliodes* Strand, *Aerophilus* Szépligeti, *Agathirsia*, *Agathis*, *Alabagrus* Enderlein, *Astiria* Enderlein, *Bassus*, *Braunsia*, *Camptothlipsis* Enderlein, *Craspedobothrus* Enderlein, *Crassomicrodus* Ashmead, *Earinus*, *Laccagathis* Watanabe, *Liyptia* Enderlein, *Mesocoelus* Schulz, *Pharpa*, *Rhamphagathis* Tobias, *Trachagathis* Viereck and *Zamicrodus* Viereck. These genera share one synapomorphy, the presence of spines along the outer surface of the mid tibia (Fig. 3d). These spines are very rare in other Braconidae and when present I do not believe that they are homologous with those found in this group of genera. When present in groups closely related to the Agathidinae, e.g. the Orgilinae, the spines are of a very different appearance, being slim and seta-like. In distantly related groups, e.g. Doryctinae, spines of the mid tibia appear similar to those of the Agathidinae; however, it is doubtful that they are homologous structures since one would have to explain the absence of these spines in many other subfamilies as convergent losses. It is far more parsimonious to hyothesize independent origins for the mid tibial spines of the two subfamilies.

Alabagrus and *Pharpa* form a monophyletic group based on two synapomorphies, viz. frons margined by carinae and fore coxa subquadrate (see fig. 6 in Sharkey, 1986). The subquadrate coxae are not found in

Table 3. Character matrix of species of the Miqa species group. (P = intermediate or polymorphic)

CHARACTERS	SHO	LATR	LEP	JAN	WAC	LATI	ELA	MAY	TRI	SIS	MIQ	KAG	TUP	URU	PAR	MIS	LOK
1. Stigma color 0. melanic 1. yellow	1	1	1	1	1	0	0	0	0	1	1	1	1	1	1	1	1
2. Fore wing pattern 0. infuscate basally 1. yellow basally	1	1	1	1	1	0	0	0	0	1	0	1	1	0	1	1	1
3. Fore wing pattern 0. lacking 2 pale bands 1. with 2 pale bands	1	1	1	1	0	0	0	0	0	0	0	0	1	1	0	1	1
4. Metasomal tergum 1 0. more than 1.2 X longer than wide 1. less than 1.2 X longer than wide	1	1	0	0	0	1	P	P	1	1	0	1	0	0	0	0	0
5. Ovipositor length 0. more than 0.7 X body 1. less than 0.7 X body	1	0	0	0	0	1	P	P	0	0	0	0	0	0	0	0	1
6. Hind femur length/width ratio 0. more than 3.5 1. less than 3.5	0	0	0	0	0	1	P	0	0	0	0	1	0	0	0	0	0
7. Propodeal sculpture 0. lateral longitudinal carinae complete 1. lateral longitudinal carinae incomplete posteriorly (Fig. 6e)	1	1	1	1	1	0	0	1	1	1	0	0	1	1	1	1	1
8. Propodeal sculpture 0. at least weakly sculptured 1. smooth	1	1	1	1	0	0	0	0	0	1	1	0	1	1	1	1	1
9. Number of spines on hind tibia 0. less than 9 1. more than 9	0	0	0	0	0	1	1	1	1	0	0	1	0	0	0	0	0

other Agathidinae nor in subfamilies closely related to the Agathidinae. Other genera of Agathidinae, e.g. *Coccydium* and *Disophrys*, have the frons bordered by carinae; however the shape of the carinae is different from that found in *Alabagrus* and *Pharpa* (Figs 1a, b).

The monophyly of *Alabagrus* is based on a character state on the first metasomal tergum of all females. In the primitive state this tergum has two lateral longitudinal carinae. These are present in many other genera of Agathidinae, as well as *Pharpa*. The primitive character state is also widespread in other subfamilies of Braconidae and Ichneumonidae. In members of *Alabagrus* these carinae have fused medially (Fig. 13a) or they have disappeared completely (Fig. 14c). Females of *A. stigma* have what I consider to be the ground plan for *Alabagrus* (Fig. 12a). Here the two carinae are still distinct and fused medially. Males of several species of *Alabagrus*, including *A. parvifasciatus* and *A. imitatus*, have retained the plesiomorphic state of two longitudinal carinae (Fig. 12d) and females of these species may have the rudiments of these carinae restricted to the base of the tergum. Sexual dimorphism with the male displaying the plesiomorphic state is common in members of *Alabagrus* and other Agathidinae.

Alabagrus incorporates four nominal genera of Agathidinae, i.e. *Alabagrus*, *Astiria*, *Craspedobothrus* and *Liyptia*. *Astiria*, *Liyptia* and *Craspedobothrus* are here synonymized with *Alabagrus*. All of these genera were erected in the same publication by Enderlein (1920) and I have chosen the name *Alabagrus* for this assemblage simply because I like the sound of the name. There is no evidence for the monophyly of any of these nominal genera unless they are all included as one taxon. In the following paragraphs I will discuss the phylogenetic position of each of the nominal genera within *Alabagrus* and thereby rationalize their inclusion in one large genus.

Astiria, the only genus that Muesebeck (1951) did not synonymize under *Agathis*, contained four species, *Astiria festiva* Enderlein, *A. haenschi* Enderlein, *A. solox* Enderlein and *A. varia* Enderlein.

Table 4. Character matrix of species of the Mojos species group. (P = intermediate or polymorphic, ? = unknown)

CHARACTERS	OLM	VER	FUS	VAR	MUI	MOC	CAI	WAT	INT	PUR	MAU	MOJ	PAC	HAE	ERY	YAR	COC	SIS	CAR	WAO	SOL	WAI	AYA	LEV	POR
1. Body color 0. melanic and pale 1. all pale	1	0	P	0	0	0	0	0	0	0	0	P	P	0	0	1	1	1	1	0	0	0	0	P	0
2. Color of antennal segments 0. unicolorous 1. flagellum paler	0	1	0	P	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3. Color pattern of fore wing 0. lacking pale base and infuscate apex 1. base pale, apex infuscate (Figs. 19a, d)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1	1
4. Color pattern of fore wing 0. lacking 1 or 2 pale bands 1. with 1 or 2 pale bands (Figs. 18d, 19d)	0	0	0	0	0	0	1	0	0	0	1	1	1	1	0	1	1	1	1	1	1	1	1	1	1
5. Color pattern of fore wing 0. not as follows 1. yellow basally and in stigmal area (Fig. 19c)	0	1	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6. Number of flagellomeres 0. greater than or equal to 45 1. less than 45	0	1	1	1	1	0	1	1	1	1	0	1	0	1	1	?	0	1	1	1	0	1	?	?	1
7. Posterior transverse scutellar ridge 0. present 1. absent	0	0	0	1	0	0	0	1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0
8. Median areola of metanotum 0. present 1. absent	0	0	0	1	0	0	0	1	0	0	0	0	1	1	0	0	0	0	0	0	1	0	0	0	1
9. Propodeum 0. with sculpture 1. lacking sculpture (Fig. 10c)	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	1	0	0	1	1
10. Propodeal sculpture 0. complete (Fig. 7a) 1. reduced (Fig. 7c)	0	0	0	1	0	0	0	0	1	0	0	0	1	1	1	1	0	0	0	0	1	1	1	1	1
11. Metasomal tergum 2 0. with transverse depression 1. lacking transverse depression	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	0	1	1	1	1	0	1

Table 5. Character matrix of species of the Texanus species group.

CHARACTERS	EKC	IXT	NIC	ALI	NAH	TEX	ALB	COR
1. Body color 0. black and pale (orange to red) 1. all black	1	1	0	0	0	0	0	0
2. Rugae of metapleuron 0. restricted to margins 1. present in ventral third or more	0	1	1	1	0	1	1	0
3. Dimensions of metasomal tergum 1 0. less than 1.3 X longer than wide 1. more than 1.3 X longer than wide	1	1	0	0	0	0	0	0
4. Dimensions of metasomal tergum 1 0. more than 0.9 X longer than wide 1. less than 0.9 X longer than wide	0	0	1	1	0	0	0	0
5. Sternaulus 0. not complete to epicnemium 1. complete to epicnemium	1	0	P	1	0	0	0	0
6. Fore wing pattern 0. infuscate 1. pale basally, infuscate apically	0	0	1	1	1	0	0	0

These have one feature in common: the sculpture of the mesosoma is greatly reduced, e.g. in most species the propodeum is completely smooth.

Loss characters are suspect in cladistic analyses and my character analysis, based on parsimony, indicates that reduction in sculpture has occurred repeatedly in *Alabagrus*. Reference to the cladograms of Figs 22 and 25 and their corresponding character matrices (Tables 1 and 4) show that the species of *Astiria* are included in two separate species groups and that they are not closely related even in the two groups.

Reduction of sculpture of the mesosoma is a continuous character. Many species of *Alabagrus* have only a partial reduction of sculpture and others are variable in that some members of a species have complete loss of sculpture on the propodeum while others have distinct, though weak, carinae. This makes the character state of reduced sculpture difficult to use in defining monophyletic groups.

Enderlein (1920) placed considerable importance on the shape of the 1*RS* cell in the fore wing. He considered the triangular, petiolate 1*RS* cell to be a diagnostic character state for members of *Astiria*. The shape of the 1*RS* cell is variable in many species of *Alabagrus*, e.g. *A. albispina*. The three-sided, petiolate 1*RS* cell is often found in species with complete sculpture on the mesosoma, a character state not compatable with Enderlein's concept of *Astiria*. Therefore the two character states used by Enderlein to define *Astiria* are both prone to homoplasy, and they are not correlated with each other. The species which the two states define are derived lineages within *Alabagrus* and are not closely related to each other.

Enderlein (1920) included two species under *Liyptia*, viz. *L. triangulifera* Enderlein and the type species *L. rufiventris* Enderlein, the latter being a junior synonym (**syn. n.**) of *Alabagrus parvifasciatus* (Cameron).

A. parvifasciatus is distinguished from most other *Alabagrus* in that males have retained the plesiomorphic condition of two carinae on the first metasomal tergum. It is perhaps this outstanding feature that prompted Enderlein to erect a new genus. However, because females have the *Alabagrus* synapomorphy of fused carinae, *Liyptia* can only be defined by the plesiomorphic character state possessed by males; for this reason it is included here in *Alabagrus*. One could propose that *Liyptia* should be classified as a genus separate from *Alabagrus*, as its sister group. I do not accept this because I hypothesize *A. parvifasciatus* to be the sister species of *A. stigma*, the type species of *Alabagrus* (Fig. 22), rather than the entire genus. A small percentage of males of *A. stigma* also have the carinae of the first metasomal tergum separated; in fact, males of the two species are sometimes impossible to separate.

The other species that Enderlein included in *Liyptia*, *L. triangulifera*, shares little in common with *A. parvifasciatus* though they are both in the same species group of *Alabagrus* (Fig. 22). Many specimens of *A. triangulifer* have a large bump on the first metasomal tergum. This is a character state that Enderlein (1920) considered to be very important and he included it in his generic key. However, the character is variable in *A. triangulifer*; the first tergum varies from almost flat (*cf.* Fig. 14b) to with a large bump. The size of the

Table 6. Character matrix of species of the Voto species group.

CHARACTERS	ARU	DIE	MIX	NIO	CAR	VAR	JUC	GUA	VOT	MAC	MAS	CHI	ROI
1. Number of flagellomeres 0. more than 39 1. less than or equal to 39	1	0	0	0	1	0	1	1	1	1	1	1	1
2. Fore wing pattern 0. infuscate 1. partly pale	0	0	0	0	0	0	0	0	1	1	1	1	1
3. Fore wing pattern 0. lacking yellow stigmal spot 1. with yellow stigmal spot (Figs. 17e, 19c)	0	0	0	0	0	0	1	1	0	0	1	0	0
4. Fore wing pattern 0. not as follows 1. base pale, apex infuscate (Figs. 19a, d)	0	0	0	0	0	0	0	0	0	1	1	1	1
5. Longitudinal ridge of scutum 0. present 1. absent	0	0	0	0	0	0	1	1	0	0	0	0	0
6. Transverse ridge of scutellum 0. present 1. absent	1	0	0	0	1	0	0	0	0	0	0	0	0
7. Propodeal sculpture 0. areolate (Fig. 7a) 1. areolae reduced or absent (Figs. 7b, c)	1	0	0	0	0	0	0	0	0	0	0	1	1

bump on the first metasomal tergum is variable in other species of *Alabagrus* and the presence of a large bump seems to have been derived several times.

Craspedobothrus was distinguished by Enderlein (1920) by the presence of a transverse depression on the second metasomal tergum. This character state is not useful to define a monophyletic unit because it is plesiomorphic. It is widely distributed throughout the *Agathis* group of genera, e.g. *Neomicrodus*, *Microdus* Nees von Esenbeck and *Braunsia* and, based on other characters, this character has reversed to the plesiomorphic state within *Alabagrus* several times.

Craspedobothrus consisted of two species, *C. fuscovittatus* and *C. laevis*. In this work, *C. fuscovittatus* becomes a junior synonym (**syn. n.**) of *A. latreilli* (Spinola). Reference to the cladograms in Figs 22 and 24 shows the two species to be rather distantly related.

Phylogeny of species of *Alabagrus*

The species of *Alabagrus* proved to be very difficult taxa for phylogenetic analysis. Very few characters are available and of these many are not ideal because they are subject to considerable homoplasy and/or they are relative and continuous characters such that the various states must be arbitrarily defined. Examples are the number of flagellomeres of the antenna, the width of the hind femur and the amount of sculpture on the propodeum. Despite these difficulties a provisional hypothesis of the phylogeny of the species of *Alabagrus* is presented. This is illustrated by the cladograms in Figs 22–27. These cladograms are based on the corresponding character matrices (Tables 1–6).

Figure 21 illustrates the phylogenetic position of the six species groups. Three of these, the *aa*, *miqa* and *texanus* species groups, are based on shared derived character states. The other three, the *suni*, *mojos* and *voto* species groups, may not be monophyletic as I have not discovered any synapomorphic character states that define them.

If monophyletic, the *suni* group may be the sister group of all remaining *Alabagrus*. It is defined by long ovipositor length which probably is the plesiomorphic character state. Ovipositor length is a character that is difficult to polarize and states are difficult to define objectively. Females of *Pharpa*, the proposed sister group of *Alabagrus*, have ovipositors that are about 1·1 × the body length. The sister group to *Pharpa* plus *Alabagrus* is unknown though it is likely to be a taxon in the *Agathis* group of genera in which the ovipositor length varies from about the length of the metasoma to considerably longer than the body. Hence, I am unsure as to whether a short or a long ovipositor is the ground-plan for *Alabagrus*. However, since a long ovipositor is present in *Pharpa*, the sister group, a long ovipositor (greater than the body length) is

hypothesized to be the ground-plan state for *Alabagrus*. Associated with the presence of a long ovipositor is parasitism of stem-boring Lepidoptera; perhaps this is the underlying synapomorphy for the *suni* group. Based on the few available host records, all other species groups of *Alabagrus*, i.e. those with short ovipositors, attack leaf-rolling or leaf-tying Lepidoptera.

Ovipositor length seems to be a consistent character at the species level. With the exception of *A. triangulifer* and *A. kiska*, all species have a very small range in ovipositor length relative to body length. None of the synapomorphies that define other species groups of *Alabagrus* occurs in the *suni* group, indicating that it is probably composed of closely related species.

Within the *suni* group (Fig. 22, Table 1), there is a derived subgroup of four species, *A. jatunqepi*, *A. kiska*, *A. uchukqepi* and *A. varius*, defined by the presence of a sharply excavated occiput (Fig. 1b). This character state is so outstanding that it could prompt some to erect a new genus for those species possessing it. The derived position of this group in *Alabagrus* (Fig. 22) does not support this view. *Alabagrus* would be undefined by synapomorphies and paraphyletic if this group was removed.

A short ovipositor is the sole synapomorphy defining the remaining species of *Alabagrus* (Fig. 21). The first branches of this lineage compose an unresolved tricotomy, *viz.* ((*aa*, *miqa*, *mojos*) (*texanus*) (*voto*)). The phylogenies of these species groups are discussed separately in the following paragraphs.

The proposed monophyletic group composed of the *aa*, *miqa* and *mojos* species groups all share an acute angle on the gena posteroventrally (Fig. 2e). The use of this character state at this level in the cladogram suggests that a ventrally rugose femur (the apomorphic state of character three) (Fig. 21) was independently derived twice, once in the *aa* and once in the *texanus* species group. It is equally parsimonious to consider character three (sculpture of the hind femur ventrally) at a higher weight than character two and the following cladogram of species groups would result: ((*aa*, *texanus*)) (*miqa*, *mojos*) (*voto*)). I prefer the hypothesis presented in Fig. 21, which gives higher weight to character two (the angle of the gena, rounded or acute), because this character has few intermediate states and is consistent intraspecifically. These qualities are lacking in character three. Some species show just a little rugose sculpture on the hind femur and others show variability in the character. The lack of consistency in this character makes it less reliable as an indicator of relationship as it can be prone to losses and convergences.

The *voto* species group probably is not monophyletic. I believe that recognition of the species groups *aa*, + *miqa* + *mojos* and the *texanus* species group render it paraphyletic (Fig. 27). It is possible that these two clades form basal lineages and that all three are monophyletic taxa, but there is no synapomorphic evidence, for the *voto* group, to support this hypothesis. Figure 27 illustrates my tentative hypothesis of relationships among the species of the *voto* group. It is based on the character state distributions given in Table 6.

The *texanus* species group (Fig. 26, Table 5) contains those species with the hind femur rugose ventrally (synapomorphy) and the gena rounded posteroventrally (symplesiomorphy). Rugose sculpture is hypothesized to be derived independently in the *aa* species group and the *texanus* species group. The cladogram in Fig. 26 does not reflect the sister group relationship that I believe *A. texanus* and *A. albispina* have; the two species are almost identical except for the colour of some body parts and the degree of rugose sculpture of the thoracic pleurae. Because most of these similarities are in continuous or measured characters they are hard to express as character states and therefore difficult to incorporate into the cladistic analysis (Fig. 26). This same problem led to less resolution in many of the other cladograms (Figs 22–27) as well.

Within the clade (*mojos*, *aa*, *miqa*) (Fig. 21) the *mojos* group is the only one not defined by synapomorphies. Members of the *mojos* group share the plesiomorphic states of those characters that define the *aa* and *miqa* groups. The *mojos* group is probably paraphyletic with the exclusion of these two groups. Figure 25 illustrates my hypothesis of the phylogenetic relationships in the *mojos* group. This cladogram is based on the character matrix of Table 4.

Members of the *miqa* species group have a strong median carinae on the first metasomal tergum (Figs 13a, b). None of the 17 members of this species group has a long ovipositor or rounded gena. This congruence reinforces my belief that the strong carina is a character state derived but once in *Alabagrus*. My preliminary hypothesis of phylogenetic relationships in the *miqa* species group is illustrated in the cladogram of Fig. 24, which is based on the character matrix of Table 3.

The final species group, *aa*, is defined by the possession of genae with an acute angle posteroventrally and hind femora rugose ventrally, the latter character state being a synapomorphy for the group. My hypothesized phylogeny of this group is illustrated in Fig. 23, which is based on the character matrix of Table 2.

Key to *Alabagrus* females

1	With the following combination of characters: 1st tergum usually (85%) with longitudinal rugae (Fig. 12a); gena rounded to obtuse posteroventrally (Figs 2b, c); pleura of mesosoma densely punctate (Fig. 6b); ovipositor longer than body; propodeum rugose (Fig. 8b)	***A. stigma*** (p. 401)
–	Without the above combination; 1st tergum without longitudinal rugae; gena variable; pleura of mesosoma usually not densely punctate (98%); ovipositor and propodeum variable	2
2(1)	With the following combination of characters: gena rounded or obtuse posteroventrally (Figs 2b, c, f); propodeum with carina weak or absent (not stronger than in Fig. 7b) and lacking distinct areolae; hind femur smooth to punctate ventrally (Figs 3b, e), rarely (2%) as punctate as in Fig. 3a; ovipositor usually (95%) equal to or longer than body, rarely as short as 0·7 × body	3
–	Without the above combination of characters, one or more of the following characters present: gena forming acute angle posteroventrally (Fig. 2c); propodeum areolate (Figs 8d, 9b); hind femur rugose ventrally (Fig. 3c); ovipositor usually (95%) shorter than body, never more than 1·1 × body length	27
3(2)	Temples angulate posteriorly (in dorsal view) (Fig. 1b)	4
–	Temples rounded posteriorly (Fig. 1d)	7
4(3)	Fore wing banded from base as follows: yellow, infuscate, yellow, infuscate (Fig. 18d); fore tibia lacking preapical spines	5
–	Fore wing variously patterned, usually dark with yellow stigmal area (Fig. 17e), never with 4 bands as above; fore tibia often with preapical spines	6
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–	Scutum black; hind wing infuscate posterodistally	***A. uchukqepi*** (p. 408)
6(4′)	Border between clypeus and gena with ridge; fore tibia without preapical spines	***A. jatunqepi*** (p. 373)
–	Border between clypeus and gena flat, lacking ridge; fore tibia often (80%) with preapical spines (cf. Fig. 3d)	***A. kiska*** (p. 375)
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–	First metasomal tergum often with anteromedial bump or ridge (Figs 14a, d, 15d), usually (95%) lacking anterolateral carinae, but if present then ovipositor about 1·1 × body length	9
8(7)	Scutum pale; fore wing infuscate (Fig. 16)	***A. imitatus*** (pt.) (p. 370)
–	Scutum dark, or if pale then wings with some yellow colour (Figs 17e, 20c)	***A. parvifasciatus*** (p. 394)
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–	Fore wing infuscate (Fig. 16) (rarely pale at base or near stigma (Fig. 17b))	20
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–	Scutum usually (95%) concolorous with propodeum, if darker then fore wing not banded as in Fig. 18d	15
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–	Metapleuron mostly melanic	***A. yanamapa*** (p. 415)
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127(125′)	Propodeum with anterior median areola often (85%) long, narrow and triangular with poorly defined lateral borders (Fig. 9d); 1st metasomal tergum more than 1·3 × longer than wide (Fig. 13d)	***A. arawak*** (pt.) (p. 357)
–	Propodeum with anterior median areola usually pentagonal and not much longer than wide (Fig. 7d); 1st metasomal tergum less than 1·3 × longer than wide	***A. nigrilitus*** (pt.) (p. 389)
128(124′)	Hind femur wide, 3·1 × longer than wide or less	***A. nahuatl*** (pt.) (p. 388)
–	Hind femur narrower, 3·5 × longer than wide or more	129
129(128′)	Metasoma all black	130
–	Metasoma partly pale distally	131
130(125)	Sternaulus reaching epicnemium (Fig. 11f)	***A. ekchuah*** (p. 366)
–	Sternaulus shorter, not reaching epicnemium (Fig. 4a)	***A. ixtilton*** (p. 372)
131(125′)	Hind coxa usually black (97%); hind femur 3·5–3·7 × longer than wide; palpi usually yellow (95%)	***A. albispina*** (pt.) (p. 356)
–	Hind coxa usually red or orange (95%); hind femur 3·9–4·2 × longer than wide; palpi usually black (95%)	132
132(131′)	Metapleuron rugose in ventral 0·5 or more (Fig. 4c); ovipositor more than 0·6 × body length	***A. texanus*** (p. 403)
–	Metapleuron mostly smooth with some rugae on ventral margin (Fig. 5f); ovipositor less than 0·6 × body length	***A. cora*** (p. 364)

***Alabagrus aa* sp. n.**

(Map 5)

HOLOTYPE ♀. *Colour.* Yellow except black as follows: antenna except distal third, hind tibia distally, hind tarsus; fore wing infuscate with yellowish clear band in apical third quarter (cf. Fig. 17a, but with yellow stigma).

Head. Antenna with 35 flagellomeres; gena right angled posteroventrally (cf. Fig. 2d). *Mesosoma.* Notauli deeply impressed (cf. Fig. 7d), median longitudinal ridge of scutum present (cf. Fig. 7d); scutellar furrow mostly smooth with weak median longitudinal carina present posteriorly (cf. Fig. 7d); apex of scutellum smooth, lacking transverse ridge (cf. Fig. 7d); sternaulus represented by several foveae posteroventrally and smooth groove 0·5 × length of mesopleuron (cf. Fig. 4f, but groove smoother); border between metepisternum and metepimeron crenulate (cf. Fig. 5d); metapleuron mostly smooth with several crenulae along ventral margin; propodeum areolate, anterior transverse carina absent (cf. Fig. 9b); mid tibia with 3 preapical spines; hind tibia with 3 apical spines; hind femur weakly rugose ventrally (cf. Fig. 3b); 4·2 × longer than wide. *Metasoma.* 1st tergum with small longitudinal bump anteriorly (cf. Fig. 14a); 1st tergum 1·4 × longer than wide; 2nd plus 3rd tergum 1·2 × longer than wide; neither 2nd nor 3rd tergum with transverse depression (cf. Fig. 15a); ovipositor 0·9 × body length, 2·9 × length of hind femur.

Length. 5·2 mm.

VARIATION ♀. The sole paratype as in holotype except apex of scutellum with transverse ridge (cf. Fig. 8a). See remarks section of *A. parunaupi*.

DISTRIBUTION AND MATERIAL EXAMINED. Map 5. Ecuador and Peru.

Holotype ♀, **Peru**: Loreto, Previsto, Cord. Azul, 850 m, 20.v.1965 (*Schunke*) (BMNH).

Paratype. **Ecuador**: 1 ♀, Dureno, 150 m, 23–28.ix.1977 (*Pena*) (AEI).

Alabagrus albispina (Cameron) comb. n.

(Figs 4a, 18e, Map 18)

Agathis albispina Cameron, 1887: 399. Holotype ♂, Mexico (BMNH) [examined].

Holotype ♂. *Colour.* Black, orange-red and yellow; antenna slightly lighter than head; palpi yellow; head and mesosoma black except notauli, lateral and posterior borders of most thoracic sclerites, metanotum, propodeum, metapleuron and mesepimeron orange-red; fore and mid legs black except tarsi yellow; hind leg orange except trochanter black and coxa black ventrolaterally; fore wing clear basally, gradually more infuscate distally (Fig. 18e).

Head. Antenna with 40 flagellomeres; gena rounded posteroventrally (cf. Fig. 2b). *Mesosoma.* Notauli well impressed (Fig. 4a); scutum with median longitudinal carina (cf. Fig. 7d); scutellar furrow with median longitudinal ridge (cf. Fig. 7d); apex of scutellum with irregular transverse ridge (cf. Fig. 7a); sternaulus foveolate, 0·5 × length of mesopleuron (Fig. 4a); border between metepisternum and metepimeron crenulate (cf. Fig. 5d); metapleuron mostly smooth with rugae in ventral third and on margins (Fig. 4a); propodeum areolate, anterior transverse carina absent (cf. Fig. 9b); mid tibia with 4 preapical spines; hind tibia with 7 apical spines; hind femur rugose ventrally (cf. Fig. 3c), 3·6 × longer than wide. *Metasoma.* 1st tergum with weak longitudinal median carina in anterior half (cf. Fig. 14d); 1st tergum 1·2 × longer than wide; 2nd plus 3rd tergum 1·3 × longer than wide; 2nd tergum with transverse depression (cf. Fig. 14d); 3rd tergum lacking transverse depression (cf. Fig. 14d).

Length. 7·3 mm.

Females. Generally less coarsely sculptured than males especially on metapleuron and propodeum; ovipositor 0·7–0·9 × body length, about 3·1 × length of hind femur.

Variation ♀ ♂. Fore and mid tarsi partly to entirely yellow; palpi rarely (2%) black; mesosoma evenly black anterior to propodeum; hind coxa varies from entirely black to with black restricted to anterolateral regions; fore wing usually completely infuscate (cf. Fig. 16); hind femur partly or completely black; sternaulus can be complete to epicnemium, especially in males; metapleuron with rugae restricted to ventral third or extended to cover ventral two-thirds (Fig. 4a or cf. Fig. 4c); posterior transverse ridge of scutellum often weak; hind femur 3·6–4·0 × longer than wide; length 5·7–8·6 mm; metasomal tergum 1 as long as wide to 1·3 × longer than wide; rise anteromedially on 1st tergum variable, always weak (cf. Figs 14b, 14d); 2nd plus 3rd tergum 1·1–1·3 × longer than wide.

Remarks. Very similar to *A. texanus* but differing from that species as follows: hind coxa wholly or partly black, palpi usually (98%) yellow; metapleuron with rugae restricted to ventral half in all females and most males (90%).

Distribution and Material examined. Map 18. Widespread throughout Mexico, through Central America to the Caribbean countries of South America.

Holotype ♂, **Mexico**: Yucatan, Guamer, Valladolid (BMNH). [Holotype very dirty, one hind leg missing after femur and the other glued to label.]

Specimens that I have determined are in the following institutions: AEI, AMNH, BMNH, FSCA, MCZ, MSUE, RNHL, TAMU, UCB, USNM.

Alabagrus alixa sp. n.

(Map 22)

Holotype ♀. *Colour.* Black, reddish orange and orange; orange as follows: palpi, fore and mid tarsus, part of hind tarsus and part of metasomal laterotergites, and sterna 1–4; reddish orange as follows: metapleuron, propodeum; hind coxa, hind femur, and hind tibia in proximal fifth; metasomal terga 1–3 reddish orange mixed with some black mottling; fore wing mostly infuscate, clear in basal third and behind stigma (cf. Fig. 19c but with melanic stigma).

Head. Antenna with 43 flagellomeres; gena acute posteroventrally (cf. Fig. 2d). *Mesosoma.* Notauli deeply impressed (cf. Fig. 7d); scutum with median longitudinal ridge (cf. Fig. 7d); scutellar furrow mostly smooth with weak hint of several longitudinal carinae; apex of scutellum with strong smooth transverse ridge (cf. Fig. 8d); sternaulus long, complete to epicnemium, composed of large crenulae (cf. Fig. 4c); metapleuron completely areolate rugose (cf. Fig. 4c, but more areolate); propodeum areolate, areolae irregular and rugose anteriorly (similar to Fig. 10f but propodeum much wider); mid tibia with 1 preapical spine; hind tibia with 4 apical spines; hind femur rugose ventrally (cf. Fig. 3c), rather wide, 3·2 × longer than wide. *Metasoma.* 1st tergum 0·8 × longer than wide, with anteromedial depression; 2nd plus 3rd

tergum 1·1 × longer than wide; 2nd tergum with transverse depression, 3rd tergum without transverse depression; ovipositor 0·6 × body length, 2·3 × length of hind femur.

Length. 8·3 mm.

DISTRIBUTION AND MATERIAL EXAMINED. Map 22. Known only from the type locality in Vera Cruz, Mexico.

Holotype ♀, **Mexico**: Veracruz, Veracruz, 20.vi.51 (*Hurd*) (USNM).

Alabagrus arawak sp. n.

(Figs 2e, 8d, 9d, 13d, 14a, 17b, Map 17)

HOLOTYPE ♀. *Colour*. Yellow and yellowish brown; yellowish brown as follows: frons, gena, temple, antenna, fore and mid legs except tarsi, hind leg except coxa and femur, ovipositor sheath; fore wing infuscate (cf. Fig. 16).

Head. Antenna with 36 flagellomeres; gena acute posteroventrally (Fig. 2e). *Mesosoma*. Notauli well impressed (Fig. 8d); scutum with median longitudinal ridge (cf. Fig. 8b); scutellar furrow with median longitudinal ridge (Fig. 8d); apex of scutellum (posterior) with well-defined rugose transverse ridge (Fig. 8d); sternaulus foveolate, 0·5 × length of mesopleuron (cf. Fig. 4a); border between metepisternum and metepimeron crenulate (cf. Fig. 5d); metapleuron mostly smooth except several crenulae on ventral margin; propodeum areolate, anterior transverse carina absent, anterior median areola weak, long and narrow (Fig. 9d); mid tibia with 3 preapical spines; hind tibia with 3 apical spines; hind femur rugose ventrally (cf. Fig. 3c); 4·3 × longer than wide. *Metasoma*. 1st tergum convex (Fig. 14a), 1·6 × longer than wide; 2nd plus 3rd tergum 1·6 × longer than wide; 2nd tergum with transverse depression barely indicated (cf. Fig. 14b but weaker); 3rd tergum lacking transverse groove; ovipositor 0·9 × body length, 3·3 × length of hind femur.

Length. 6·3 mm.

ALLOTYPE ♂. Essentially as in ♀ holotype except for minor colour variations and as follows: antenna with 34 flagellomeres; notauli deeper (Fig. 8d); anterior transverse ridge of propodeum complete (Fig. 8d); 1st tergum of metasoma with well-defined median longitudinal carina (Fig. 13d); length 5·2 mm.

VARIATION ♀ ♂. This is a widespread species with a fair deal of variation. Males usually differ from females in the possession of anterior transverse carina on the propodeum. The presence of a longitudinal ridge on the 1st metasomal tergum is relatively rare and present only in males.

Variation as follows: coloration varies greatly; from entirely yellow to predominantly orange with head and appendages brown or black, to orange with pro- and mesothorax entirely black; leg segments all vary from yellow to black; terminal segments of metasoma rarely (5%) black or brown, this darker colour more common in males; fore wing can be somewhat yellowish infuscate especially basally and behind stigma (Fig. 17b and rarely as in Fig. 20c); antenna with 33–39 flagellomeres; fore wing sometimes yellowish infuscate; female very rarely (2%) with anterior transverse carina on propodeum (cf. Fig. 8d); 1st metasomal tergum of males often lacking median carina; 1st metasomal tergum of males and females from 1·4–1·6 × longer than wide; length 4·6–6·2 mm.

DISTRIBUTION AND MATERIAL EXAMINED. Map 17. Widespread, southern Mexico to northern Argentina.

Holotype ♀, **Ecuador**: Pinchincha, 16 km E. Sto. Domingo, Tinalandia, 500 m, 4–14.vi.1976 (*Peck*) (CNC).

Paratypes. **Argentina**: Salta: 2 ♂, Abra Grande, Oran, 18.iv.–5.v.1969 (*Porter*) (MCZ); 1 ♂, Rio Pescado, nr Oran, 23.–29.v.1970 (*Porter*) (IML). **Belize**: 5 ♀, 3 ♂, Middlesex, 125 m, ix.–x.1956 (*Welling*) (CNC); 1 ♂, Melinda For. Sta., nr Stann Creek, 8.vii.1963 (*Porter*) (MCZ); 1 ♀, 1 ♂, Punta Gorda, 12.–26.v.1982 (*Kelly*) (BMNH); 1 ♀, 40 km NW. Punta Gorda, Salemanca, 28.viii.–4.ix.1978 (BMNH). **Bolivia**: Cochamba: 1 ♂, Cochamba, 17 km E. Villa Tunari, 21.–25.vii.1973 (IML). **Brazil**: Goias: 1 ♀, Vila Vera, 50°30′W, 12°38′S, x.1973 (*Alvarenga*) (AEI); Mato Grosso: 1 ♀, Sinop, x.1976 (*Alvarenga*) (CNC); Para: 2 ♂, Rio Acara, 1930 (*Horvath*) (TMB). **Colombia**: Amazonas: 1 ♂, Leticia, 24.ii.–1.iii.1974 (*Howden*) (AEI); 1 ♂, 17 km E. Buenaventura, 18.–20.ii.1970 (*Howden*) (AEI); 2 ♀, 1 ♂, Guainia, San Jose, 12.xi.1944 (*Hambbleton*) (USNM); Valle del Cauca: 1 ♀, Buenaventura, Zabaleta-Rio Dagua forest road, 100 m, 29.ix.1971 (*Cooper*) (BMNH); 3 ♂, 17 km E. Buenaventura, Anchicaya, Dam, 370 m, 18.–20.ii.1970 (*Howden*) (AEI); 1 ♀, 17 km S. Cali, 1000 m, 10.x.1971 (*Eberhard & Garcia*) (CNC); 1 ♀, State?, Las Cumbre, 23.v.1914 (CU). **Costa Rica**: 1 ♂, Bataan, 24.iv.1957 (*Shenefelt*) (SC); 1 ♀, 19 km SW. Canas, 27.ii.1964 (*Evans*) (MCZ); 1 ♂, La Lola, 19.vi.1961 (SC); 2 ♀, Pto. Viejo, 50 m, ii.1980 (*Mason*) (MC); 1 ♀, Rincon, Osa Pen., 10.–15.viii.1966 (*Moldenke*) (AMNH); 1 ♀, 4 km SW. Rincon, Osa Pen., 21.–28.ii.1967 (MCZ); 1 ♀, 1 ♂, 8 km SW. Sta. Clara de San Carlos, 19.ii.1964 (*Evans*) (MCZ); 3 ♂, Surrubres (TMB); 2 ♀, 2 ♂, Turrialba, 1.viii.1977 (*Hansen*) (CNC); 1 ♀, Turrialba,

20.ix.1952 (*Viale*) (USNM). **Ecuador**: allotype ♂, Pinchincha, 47 km S. Sto. Domingo, Rio Palenque Sta., 22.–31.vii.1976 (*Peck*) (CNC). Bolivar: 1 ♀, Balzapamba, 700 m, 5.vi.1938 (*Clark & MacIntyre*) (AEI); Esmeraldas: 1 ♀, San Lorenzo, 3.–10.vi.1975 (*Peck*) (AEI); 1 ♂, Coca, v.1965 (*Pena*) (AEI); Napo: 1 ♀, Napo and Coca Rivers, 2.v.1965 (*Pena*) (AEI); 2 ♂, Tena, 400 m, 16.–17.ii.1983 (*Sharkey*) (CNC); Pinchincha: 3 ♂, Monte Enela, nr Sto. Domingo, 4.ii.1983 (*Sharkey*) (CNC); 9 ♀, 11 ♂, Santo Domingo, 17.–30.v.1975 (*Peck*) (AEI); 22 ♂, Santo Domingo, 26.ii.1981 (*Howden*) (AEI); 5 ♀, 4 ♂, Rio Palenque Res. Sta., 47 km S. Santo Domingo, 23.–31.vii.1976 (*Peck*) (CNC); 6 ♀, 10 ♂, Rio Palenque Res. Stat., 47 km S. Sto. Domingo, 4.ii.1983 (*Masner & Sharkey*) (CNC); 2 ♀, 5 ♂, Rio Palenque Res. Stat., 47 km S. Sto. Domingo, ii.1983 (*Sharkey*) (CNC); 1 ♀, 1 ♂, Tinalandia, 16 km E. Sto. Domingo, 680 m, 15.–30.vi.1975 (*Peck*) (CNC); 1 ♀, 1 ♂, Tinalandia, 8.ii.83 (*Masner & Sharkey*) (CNC); 3 ♀, 4 ♂, Tinalandia, vii.1983 (*Sharkey*) (CNC). **Guatemala**: 1 ♂, Los Aurantes, Kellerman (MCZ). **Guyana**: 1 ♂, Bartica, 18.ii.1913 (CU). **Mexico**: Chiapas: 1 ♀, 16°58′N, 91°47′W, 23.–27.x.1978 (*Rawlins*) (CNC); 1 ♂, 10·6 km S. San Carlos, 11.iii.1953 (*Smith*) (UCB); Oaxaca: 1 ♂, Palomarea, 5.–21.ix.1961 (*Dreisbach*) (MSEU); 1 ♀, Metate, 85·5 km SW. of Tuxtepec, 900 m, 21.x.1962 (*Townes*) (AEI); Tabasco: 1 ♂, 6·5 km N. Teapa, 14.vi.1965 (*Burke, Meyer & Schaffner*) (TAMU); 1 ♂, Teapa, 29.vi.1964 (*Pallister*) (AMNH); Veracruz: 4 ♀, 2 ♂, Fortin, 900 m, 1962 (*Epping*) (RNHL); 1 ♂, Minatitlan, 26.viii.–1.ix.1961 (*Dreisbach*) (MSUE); 1 ♀, 1 ♂, Fortin, v. and vii.1965 (*Weems*) (FSCA); 1 ♀, Orizaba, 13.ii.1954 (*Dreisbach*) (MSUE). **Panama**: 1 ♂, Bocas del Toro, 2.iv.1924 (*Bradley*) (CU); 1 ♀, Barro Colorado Island, 6.xi.1930 (AMNH); 6 ♀, 4 ♂, Margarita, i., ii., iv.1960 (*Breeland*) (AEI); 3 ♀, 3 ♂, Nuevo Limon, ix.1946 (USNM). **Peru**: Cuzco: 1 ♂, Quince Mil, 750 m, 10.–15.1962, (*Pena*) (AEI); 2 ♂, Quince Mil, 750 m nr Marcapata, 10.–15.xi.1962 (*Pena*) (AEI). **Trinidad**: 1 ♂, Cone Farm, 23.iv.1961 (*Gopaul*) (CNC); 1 ♂, La Brea, 18.x.1918 (*Morrison*) (USNM); 8 ♂, Morne Bleu, 830 m, viii.1969 (*Howden*) (AEI, CNC); 1 ♂, Tunapuna, 5.iii.1961 (*Gopaul*) (CNC); 1 ♂, St. Augustine, 14.ii.1961 (*Gopaul*) (CNC); 2 ♀, 1 ♂, St. Augustine, viii.1976 (BMNH); 1 ♂, St Augustine, 2.iii.1953 (*Simmonds*) (CIBC). **Venezuela**: Aragua: 1 ♂, Portachuelo, Rancho Grande, 1100 m, 22.v.1981 (*Garcia & Clavijo*) (UCV); 1 ♂, Rancho Grande, 24.xi.1968 (*Van Doesburg*) (RNHL); Carabobo: 1 ♂, San Esteban Valley, Las Quiguas, 20.–27.i.1940 (*Anduze*) (USNM).

Alabagrus arua sp. n.

(Map 8)

Holotype ♀. *Colour.* Black, reddish black, orange and yellow; yellow as follows: palpi, tegula, sterna and lateroterga of metasomal segments 1–3; reddish black as follows: scutum, fore and mid legs, stigma of fore wing, metasomal segment 8, hind leg except coxa and distal four-fifths of femur orange; orange as follows: mesepimeron, scutellum posteriorly, metanotum, propodeum, metapleuron, and most of metasoma; fore wing infuscate (cf. Fig. 16).

Head. Antenna with 35 flagellomeres; gena with obtuse angle posteriorly (cf. Fig. 2c). *Mesosoma.* Notauli well impressed (cf. Fig. 9b); scutum with weak anteromedial longitudinal ridge (cf. Fig. 9b); scutellar furrow with median ridge (cf. Fig. 9b); apex of scutellum mostly smooth with several weak punctures (cf. Fig. 7c)); median areola of metanotum not excavated, posterior margin not elevated (cf. Fig. 9a); sternaulus foveolate, 0·5 × length of mesopleuron (cf. Fig. 4a); border between metepisternum and metepimeron crenulate (cf. Fig. 5d); metapleuron mostly smooth with crenulae marginally (cf. Fig. 5e); propodeum areolate, anterior transverse carina weak; mid tibia lacking preapical spines; hind tibia with 3 apical spines; hind femur smooth ventrally (cf. Fig. 3e), 4·3 × longer than wide. *Metasoma.* 1st tergum with weak median longitudinal ridge (cf. Fig. 14d); 1st tergum 1·9 × longer than wide; 2nd tergum with weak transverse depression (cf. Fig. 14b); 3rd tergum lacking transverse depression (cf. Fig. 14d); ovipositor 0·7 × body length, 2·5 × length of hind femur.

Length. 5·4 mm.

Allotype ♂. As in ♀ holotype except: metasomal terga 5 to 8 partly brown; posterior transverse ridge of scutellum complete but very weak (cf. Fig. 7b); anterior median areola of propodeum irregular, anterior transverse carina strong (cf. Fig. 7d).

Variation ♀ ♂. Coloration varies considerably, those areas black or reddish black on the holotype vary from reddish brown to black; metasoma often lacking yellow coloration; rarely with distal half black; hind femur orange to black; stigma reddish black to black; posterior transverse ridge of scutellum smooth to weakly rugose; sternaulus reduced to few foveae posteroventrally (cf. Fig. 5f); anterior median areola of propodeum often (40%) weak (cf. Fig. 9a); mid tibia with 0 to 3 preapical spines; hind tibia with 3 to 6 apical spines; length 4·9–6·1 mm.

DISTRIBUTION AND MATERIAL EXAMINED. Map 8. Costa Rica south to Bolivia.

Holotype ♀, **Ecuador**: Napo, Limoncocha, 250 m, 15.–28.vi.1976 (*Peck*) (CNC).

Paratypes. **Brazil**: Amazonas: 1 ♀, Res. Ducke, 26 km NE. Manaus, ix.1981 (*Rafael*) (CNC); 1 ♀, 1 ♂, Manaus, Univ. Campus, 22.–28.vi.1982 (*Rafael*) (CNC). **Colombia**: District Especial, 1 ♂, Bogota (*Lindig*) (ZMHB); Magdalena: 2 ♂, Curumani 60 km S. Becerril, 22.vii.1968 (*Malkia*) (AMNH); Valle de Cauca: 1 ♀, Cali, 1.iv.1965 (*West*) (AEI). **Costa Rica**: 3 ♀, 1 ♂, Alejuela, La Fortuna, 200 m, 18.ii.1964 (*Evans*) (MCZ); 1 ♀, 4 km W. La Fortuna, 18.ii.1964 (*Evans*) (MCZ). **Ecuador**: allotype ♂, same data as holotype. Napo: 3 ♀, 9 ♂, same data as holotype; 41 ♀, 34 ♂, Limoncocha, on Rio Napo, xii.1973 to ix.1974 (*Drummond*) (FSCA); 1 ♀, 1 ♂, Tena, 400 m, 16.–17.ii.1983 (*Sharkey*) (CNC); Pinchincha: 1 ♂, Sto. Domingo, 26.ii.1981 (*Howden*) (AEI); Zamora: 1 ♀, Rio Jumboe, 1.iv.1965 (*Pena*) (AEI); 1 ♀, Zamora, Chinchipe, *c.* 1000 m, 29.x.1978 (*Cooper*) (BMNH). **Guyana**: 1 ♀, Bartica, 23.i.1913 (CU); 1 ♂, Bartica, 15.iv.1913 (CU); 2 ♀, 2 ♂, Bartica, Heyne (ZMHN); 1 ♀, 1 ♂, Kartoba, 1920 (AMNH); 1 ♀, Kartabo, vii.–viii.1920 (MCZ). **Panama**: 1 ♀, C.Z., Barro Colorado Is., i.–iii.1944 (*Zetek*) (USNM). **Peru**: Cuzco: 1 ♀, 1 ♂, Quince Mil, 20.–30.x. and 10.–15.xi.1962 (SC); 1 ♀, Quince Mil, 750 m, nr Marcapata, 10.–15.xi.1962 (*Pena*) (AEI). **Surinam**: 1 ♂, Albina, 16.vi.1963 (*Van Doesburg*) (RNHL); 1 ♀, Lelydorp, Sumatra Rd, 1.–3.iv.1964 (*Geijskes*) (RNHL); 1 ♂, Lelydorp, 21.vii.1938 (*Geijskes*) (RNHL). **Trinidad**: 1 ♂, Bamboo Cr., 20.i.1961 (*Gopaul*) (CNC); 3 ♀, 7 ♂, Cumuto Arepo, Thaxter (MCZ); 1 ♂, Curepe, xi.1976 (*Bennett*) (BMNH); 1 ♂, Maracas Valley, xi.1977 (*Bennett*) (BMNH); 2 ♀, Montserrat, vi.1905 (*Busck*) (USNM); 1 ♂, Moran Pool Rd., Totton (BMNH); 1 ♀, 4 ♂, Morne Bleu, viii.1969 (*Howden*) (AEI, CNC); 2 ♀, 1 ♂, St. Augustine, viii.76 (*Bennett*) (BMNH); 2 ♀, Spring Hill Estate, Arima Valley (*Mees*) (RNHL). **Venezuela**: Yaracuy: 1 ♂, 27.i.1971 (*Casares & Gelvez*) (UCV).

Alabagrus aymara sp. n.

(Map 12)

HOLOTYPE ♀. *Colour.* Black except as follows: palpi, fore and mid tarsus, yellow; propodeum, hind coxa except laterally, hind femur, and metasoma except apically, all orange; fore wing yellow basally gradually becoming infuscate apically, infuscate beyond stigma (cf. Fig. 19a, but with stigma mostly pale).

Head. Antenna with ? flagellomeres (antennae broken); gena right angled posteroventrally (cf. Fig. 2e). *Mesosoma.* Notauli deeply impressed (cf. Fig. 7d); scutum with median longitudinal ridge (cf. Fig. 7d); scutellar furrow smooth, lacking longitudinal carinae (cf. Fig. 8a); apex of scutellum with smooth, transverse ridge (cf. Fig. 9b); sternaulus 0·3 × length of mesopleuron, composed of large foveae (cf. Fig. 8a, though smaller than in figure); border between metepisternum and metepimeron crenulate (cf. Fig. 5d); metapleuron smooth (cf. Fig. 6c); propodeum mostly smooth (cf. Fig. 10c, though with a trace of posterior transverse carinae); mid tibia lacking preapical spines; hind tibia with 3 apical spines; hind femur smooth ventrally (cf. Fig. 3e), 3·8 × longer than wide. *Metasoma.* 1st tergum convex (cf. Fig. 14a); 1st tergum 1·2 × longer than wide; 2nd plus 3rd tergum 1·6 × longer than wide; 2nd tergum with weak transverse depression (cf. Fig. 14d); 3rd tergum lacking transverse depression (cf. Fig. 14d); ovipositor 0·9 × body length, 3·6 × length of hind femur.

Length. 8·3 mm.

DISTRIBUTION AND MATERIAL EXAMINED. Map 12. Known only from the type locality in Huanuco, Peru.

Holotype ♀, **Peru**: Huanuco, Tingo Maria, 620 m, 5.–12.xii.1964 (*Porter*) (MCZ).

Alabagrus botocudo sp. n.

(Map 3)

HOLOTYPE ♀. *Colour.* Yellow, yellow-brown, orange and black; head except palpi and antennal flagellomeres black, yellow as follows: palpi, legs except hind coxa, tegula, metanotum, propodeum, and lateral lobes of scutum; yellow-brown as follows: median lobe of scutum, scutellum, mesosomal pleura, and hind coxa; orange as follows: antennal flagellomeres, and metasoma; fore wing infuscate except stigmal area yellow (cf. Fig. 17e).

Head. Antenna with 36 flagellomeres; gena right angled posteroventrally (angle slightly sharper than Fig. 2d). *Mesosoma.* Notauli deeply impressed (cf. Fig. 7d); scutum with median longitudinal ridge anteriorly (cf. Fig. 7d); scutellar furrow with median longitudinal ridge (cf. Fig. 7d); apex of scutellum (posterior) with rugose transverse ridge (cf. Fig. 7a); sternaulus short, 0·3 × mesopleuron length, composed of 3 large foveae (cf. Fig. 5f); border between metepisternum and metepimeron crenulate (cf. Fig. 5d); metapleuron mostly smooth, with crenulae along ventral margin; propodeum areolate, anterior transverse carina lacking (cf. Fig. 9b); mid tibia with 2 preapical spines, hind tibia with 3 apical spines; hind

femur rugose ventrally (cf. Fig. 3c), 4·1 × longer than wide. *Metasoma.* 1st tergum with small, distinct, anteromedial bump (cf. Fig. 15d); 1st tergum 1·4 × longer than wide; 2nd tergum 1·2 × longer than wide; 2nd tergum with weak transverse depression (cf. Fig. 14b); 3rd tergum lacking transverse depression; ovipositor 0·9 × body length, 3·5 × length of hind femur.

Length. 5·7 mm.

ALLOTYPE ♂. As in the holotype ♀ except as follows: hind legs mostly yellow-brown; antenna with 34 flagellomeres, metapleuron with rugae in ventral third (cf. Fig. 4a); length 4·8 mm.

VARIATION ♀ ♂. Body can be more melanic, with some black on scutum and apex of metasoma; anterior transverse carina of propodeum present in some males (cf. Fig. 7d); base of wing can be less infuscate than apex (cf. Fig. 19c); length 4·6–5·7 mm.

DISTRIBUTION AND MATERIAL EXAMINED. Map 3. Known only from the type locality in Santa Catarina, Brazil.

Holotype ♀, **Brazil**: Santa Catarina, Nova Teutonia, 27°11′S, 52°23′W, ii.1965 (*Plaumann*) (BMNH).

Paratypes. Allotype ♂, same data as holotype except iv.1966; 12 ♀, 8 ♂, same locality and collector as holotype, ii.–iv., vii. and xii., from 1936 to 1966 (AEI, BMNH, CNC).

Alabagrus caingang sp. n.

(Map 4)

HOLOTYPE ♀. *Colour.* Orange and black with palpi and portions of fore and mid legs yellow; antenna brown; orange as follows: lateral lobes of scutum, metanotum, metapleuron, propodeum, and hind leg (tibia and tarsus tending towards brown); metasoma mostly orange, however, brown ventrally and tergum 2 plus 3 brownish orange; fore wing infuscate with stigmal area yellow and base of wing yellowish hyaline (cf. Fig. 20c).

Head. Antenna with 38 flagellomeres; posterolateral corner of gena right angled (cf. Fig. 2d). *Mesosoma.* Notauli deeply impressed (cf. Fig. 7d); scutum with median longitudinal ridge (cf. Fig. 7d); scutellar furrow with median longitudinal carina (cf. Fig. 7d); apex of scutellum with weak, irregular, transverse ridge (cf. Fig. 7c); sternaulus composed of several foveae posteroventrally and weak smooth impression extending 0·5 × length of mesopleuron (cf. Fig. 4f, but groove smoother); border between metepisternum and metepimeron crenulate (cf. Fig. 5d); metapleuron mostly smooth, with crenulae along margins (cf. Fig. 5c); propodeum areolate, anterior transverse carina reduced, anterior areola more than 2 × longer than posterior areola (cf. Fig. 9d); mid tibia with 3 preapical spines; hind tibia with 5 apical spines; hind femur smooth ventrally, 3·9 × longer than wide. *Metasoma.* 1st tergum convex (cf. Fig. 14b), 1·6 × longer than wide; 2nd plus 3rd tergum 1·5 × longer than wide; 2nd tergum with, and 3rd tergum without transverse depression (cf. Fig. 14d); ovipositor 0·8 × body length, 3·1 × length of hind femur.

Length. 6·7 mm.

ALLOTYPE ♂. As in holotype except as follows: scutum almost entirely black; antenna with 37 flagellomeres; fore wing not significantly lighter basally than apically; anterior transverse carina of propodeum present as well as secondary rugae (cf. Fig. 8d); length 6·7 mm.

VARIATION ♀ ♂. Fore wing infuscate or yellowish hyaline basally (cf. Figs. 20c, 17e); rarely orange colour reduced on lateral lobes of scutum replaced by black; anterior areola of propodeum barely indicated in some females; male propodea more sculptured than female, anterior areola and carina always complete; transverse depression of metasomal tergum 2 deeper in male specimens.

DISTRIBUTION AND MATERIAL EXAMINED. Map 4. South-eastern Brazil.

Holotype ♀, **Brazil**: Parana, Campina Grande nr Curitiba, 15.ii.1966 (*Townes*) (AEI).

Paratypes. **Brazil**: allotype ♂, same data as holotype; Parana: 7 ♀, ♂, same data as holotype except various dates between 7.ii. and 21.ii.1966; 2 ♀, 1 ♂, Quatro Barros nr Curitiba, 5.–7.ii.1966 (*Townes*) (AEI); Santa Catarina: 1 ♀, 2 ♂, Nova Teutonia, 27°11′S, 52°23′W, 6.vii.1937, 8.x.1937 and iv.1966 (*Plaumann*) (BMNH, CNC).

Alabagrus calibi sp. n.

(Map 14)

HOLOTYPE ♀. *Colour.* Orange, brown and black; head black with face reddish black; antenna paler distally; pronotum and mesopleuron ventrally black; fore and mid legs brown except tarsi yellow; hind trochanter black; hind coxa and femur orange; hind tibia and tarsus reddish brown; remainder of body orange; scutum

dark, brownish orange; fore wing mostly infuscate with stigma yellow and small area behind stigma clear (cf. Fig. 20c).

Head. Antenna with 41 flagellomeres; gena right angled posteroventrally (cf. Fig. 2d). *Mesosoma.* Notauli deeply impressed (cf. Fig. 7d); scutum with median longitudinal ridge (cf. Fig. 7d); scutellar furrow with median carina (cf. Fig. 7d); apex of scutellum with weak, rugose, transverse ridge (cf. Fig. 7c); sternaulus long, foveolate, 0·7 × length of mesopleuron (cf. Fig. 4c); border between metepisternum and metepimeron crenulate (cf. Fig. 5d); metapleuron mostly smooth with crenulae on margins (cf. Fig. 5c); propodeum areolate, anterior transverse carina weak (cf. Fig. 9b), anterior lateral areola with some weak rugae (cf. Fig. 8d); mid tibia with 2 preapical spines; hind tibia with 3 apical spines; hind femur rugose ventrally (cf. Fig. 3c), 4·0 × longer than wide. *Metasoma.* 1st tergum evenly convex (cf. Fig. 14d), 1·2 × longer than wide; 2nd plus 3rd tergum 1·4 × longer than wide; 2nd tergum with, and 3rd tergum without transverse depression (cf. Fig. 14d); ovipositor 0·7 × body length, 2·4 × length of hind femur.

Length. 6·2 mm.

Allotype ♂. As in female holotype except as follows: mesosoma black except propodeum and mesopleuron; metapleuron rugose in ventral third (cf. Fig. 4a); propodeum more heavily sculptured with many small secondary carinae and rugae (cf. Fig. 8a); 1st metasomal tergum with median longitudinal carinae 0·5 × its length (cf. Fig. 13d); body length 7·1 mm. (Allotype with head and fore leg mounted on separate point.)

Variation ♀. (The allotype is the only ♂ known.) Compared with the holotype most specimens have anterior portion of mesosoma, including scutum, black; basal portion of fore wing clear; apical tip of metasoma black and some black mottling on metasomal terga; transverse ridge of scutellum can be very reduced and appear smooth (cf. Fig. 8a); propodeum can lack rugae laterally; length 6·2–7·0 mm.

Distribution and Material examined. Map 14. Known from Trinidad, Surinam and northern Bolivia, presumably more widespread.

Holotype ♀, **Surinam**: Carolina Kreek, 8.v.1963 (*Van der Vecht*) (RNHL).

Paratypes. **Bolivia**: Beni: 1 ♀, Rio Itenez, Pampa de Meio, 11.–13.ix.1964 (*Bouseman & Lussenhop*) (AMNH). **Surinam**: allotype ♂, Paramaribo, Charlesburg, Krepi, 18.–21.i.1964 (*Geijskes*) (RNHL); 1 ♀, same data as holotype; 1 ♀, Albina, 25.vi.1963 (*Van der Vecht*) (RNHL); 1 ♀, Carolina Kreek, 8.v.1963 (*Van der Vecht*) (RNHL); 1 ♀, nr Paramaribo, 18.–23.xii.1963 (AEI); 1 ♀, Zanderij Sav., 26.x.1964 (*Geijskes*) (RNHL). **Trinidad**: 1 ♀, St George, Maracas Valley, x.1977 (*Bennett*) (BMNH).

Alabagrus caquetio sp. n.

(Map 19)

Holotype ♀. *Colour.* Mostly orange except black as follows: antenna, labrum, part of fore trochanter, fore femur, fore tibia, part of mid trochanter, mid femur, tarsus and tibia, part of hind trochanter, hind tibia distally and most of hind tarsus; fore wing infuscate (cf. Fig. 16).

Head. Antenna with 40 flagellomeres; gena acute posteroventrally (cf. Fig. 2e). *Mesosoma.* Notauli well impressed (cf. Fig. 7d); scutum with median longitudinal ridge (cf. Fig. 7d); scutellar furrow smooth, lacking longitudinal carina (cf. Fig. 8a); apex of scutellum with weak smooth transverse ridge (cf. Fig. 7d); sternaulus foveolate, 0·5 × length of mesopleuron (cf. Fig. 4a); border between metepisternum and metepimeron crenulate (cf. Fig. 5d); metapleuron mostly smooth except for some crenulae on ventral margin; propodeum areolate, anterior transverse carina weak but complete; mid tibia with 3 preapical spines; hind tibia with 3 apical spines; hind femur weakly rugose ventrally (cf. Fig. 3b); 3·8 × longer than wide. *Metasoma.* 1st tergum with small bump anteromedially (cf. Fig. 14b but slightly larger bump than in figure); 1st tergum 1·3 × longer than wide; 2nd plus 3rd tergum 1·5 × longer than wide; 2nd tergum with transverse depression (cf. Fig. 14d); 3rd tergum lacking transverse depression (cf. Fig. 14d); ovipositor 0·8 × body length, 2·7 × longer than hind femur.

Length. 7·0 mm.

Variation ♀. Antenna with 39–42 flagellomeres; legs lighter, almost completely yellow; mid tibia with 0–3 preapical spines; body length 4·8–7·2 mm.

Distribution and Material examined. Map 19. Venezuela.

Holotype ♀, **Venezuela**: Zulia, Tucuco, 23.iv.81 (*Townes*) (AEI).

Paratypes. **Venezuela**: Zulia: 2 ♀, Tucuco, iv.1981 (*Townes*) (AEI); 1 ♀, Bolivar, Akuriman, x.1940 (*Anduze*) (CU).

Alabagrus cara sp. n.

(Fig. 19d, Map 2)

Holotype ♀. *Colour.* Yellow except black as follows: head except mouth parts, hind coxa distolaterally, hind trochanter, hind tibia in distal third and hind tarsus; fore wing yellow basally, infuscate in distal third (cf. Fig. 19d).

Head. Antenna with 39 flagellomeres; gena acute posteroventrally (cf. Fig. 2e). *Mesosoma.* Notauli deeply impressed (cf. Fig. 9b); median longitudinal ridge of scutum weak (cf. Fig. 9b); scutellar furrow with weak median longitudinal ridge (cf. Fig. 7d); apex of scutellum with acute, transverse carina (cf. Fig. 8d); sternaulus foveolate, 0·5 × length of mesopleuron (cf. 4a); border between metepisternum and metepimeron crenulate (cf. Fig. 5d); metapleuron mostly smooth with several crenulae along ventral margin; propodeum areolate, anterior transverse carina lacking, anterior median areola weak (cf. Fig. 7c); mid tibia with 2 preapical spines; hind tibia with 3 apical spines; hind femur smooth ventrally (cf. Fig. 3e), 4·0 × longer than wide. *Metasoma.* 1st tergum with small longitudinal bump anteromedially (cf. Fig. 14a); 1st tergum 1·7 × longer than wide; 2nd plus 3rd tergum 1·5 × longer than wide; neither 2nd nor 3rd tergum with transverse depression (cf. Fig. 15a); ovipositor 0·8 × body length, 2·9 × length of hind femur.

Length. 6·7 mm.

Allotype ♂. As in holotype ♀ except as follows: fore wing infuscate (cf. Fig. 16); propodeum with strong anterior median areola and weak anterior transverse carina.

Variation ♀. Fore and mid trochanters yellow, brown or black; propleuron yellow, brown or black.

Distribution and Material examined. Map 2. Known only from Costa Rica and the coastal lowlands of Ecuador but likely to be found in Colombia and Panama.

Holotype ♀, **Ecuador**: Pinchincha, 16 km E. Santo Domingo, Tinalandia, 4.v.–25.vii.1985 (*Peck*) (CNC).

Paratypes. **Costa Rica**: 1 ♀, Braulio Carrillo Nat'l Park, 400 m, 10.–11.iv.1985 (*Goulet & Masner*) (CNC); 1 ♀, Turrialba, vii.1963 (*Porter*) (MCZ). **Ecuador**: allotype ♂, Pinchincha, 16 km E. Santo Domingo, Trinalandia, 4.v.–25.vii.1985 (*Peck*) (CNC); Esmeraldas: 1 ♀, San Mateo, 1.xi.1956 (*Foerster*) (CNC); Pichincha: 1 ♀, Santo Domingo, 215 m, 17.–30.v.1975 (*Peck*) (AEI).

Alabagrus carib sp. n.

(Map 20)

Holotype ♀. *Colour.* Orange except as follows: head excluding palpi black, brown as follows: propleuron, fore and mid legs, hind trochanter, tibia and tarsus; distal half of metasoma mottled brown and orange; fore wing infuscate (cf. Fig. 16).

Head. Antenna with 38 flagellomeres; gena rounded posteroventrally (cf. Fig. 2b). *Mesosoma.* Notauli well impressed (cf. Fig. 7d); scutum with median longitudinal ridge (cf. Fig. 7d); scutellar furrow with weak median carina (cf. Fig. 9b); apex of scutellum with smooth transverse ridge (cf. Fig. 7d); median areola of metanotum not excavated; posterior margin flush with areola (cf. Fig. 9a); sternaulus foveolate, 0·5 × length of mesopleuron (cf. Fig. 5c); border between metepisternum and metepimeron crenulate (cf. Fig. 5d); metapleuron mostly smooth with crenulae along ventral margin; propodeum areolate; anterior median areola weak, anterior transverse carina weak (cf. Fig. 9a); mid tibia with 4 preapical spines; hind tibia with 5 apical spines; hind femur smooth ventrally (cf. Fig. 3e); 3·9 × longer than wide. *Metasoma.* 1st tergum with weak median longitudinal ridge (cf. Fig. 14d); 1st tergum 1·4 × longer than wide; 2nd plus 3rd tergum 1·4 × longer than wide; 2nd tergum with transverse depression weak medially (cf. Fig. 14d); 3rd tergum lacking transverse depression (cf. Fig. 14d); ovipositor 0·8 × body length, 3·0 × length of hind femur.

Length. 6·1 mm.

Allotype ♂. As in ♀ holotype except as follows: metasoma all orange except apical segment; metapleuron weakly rugose in ventral third (cf. Fig. 4a, but weaker); propodeum with strong median anterior areola and anterolateral area with transverse rugae (cf. Fig. 9b); mid tibia with 2 preapical spines; hind tibia with 7 apical spines; length 6·2 mm.

Variation ♀, ♂. Apex of scutellum from almost smooth to with acute transverse ridge (cf. Figs 7d, 8d); anterior transverse carinae of propodeum complete in most males; length 6·0–7·4 mm.

Distribution and Material examined. Map 20. Lesser Antilles.

Holotype ♀, **St Vincent** (no date) (*Smith*) (BMNH).

Paratypes. **Grenada**: 2 ♀, 1910 (*Brues*) (MCZ); 1 ♀, L'Anse aux Epines, 8.ii.1986 (*Clarke*) (USNM); 3 ♀, 6 ♂, Mount Gay Est., Leeward Side (*Smith*) (BMNH, USNM); 2 ♂, Balthazar, Windward Side (*Smith*) (BMNH); 1 ♀, 1 ♂, St Georges (*Smith*) (BMNH). **St Vincent**: allotype ♂, (no date) (*Smith*) (BMNH); 5 ♀, 4 ♂ (*Smith*) (BMNH, USNM).

Alabagrus caudatus (Szépligeti) comb. n.

(Map 3)

Agathis caudata Szépligeti, 1904: 195. Holotype ♀, Peru (TMB) [examined].

Holotype ♀. *Colour.* Black and yellowish orange; yellowish orange as follows: palpi, tegula, tibiae and tarsi of fore and mid legs, mesopleuron posteroventrally, mid and hind coxae ventrally, hind femur and basal two-thirds of hind tibia, metanotum, mesepimeron, metapleuron, propodeum and metasoma except apical fifth; fore wing banded from base as follows: yellow, infuscate, yellow, infuscate (cf. Fig. 18d).

Head. Antenna with 38 to 42 flagellomeres (antennae broken on holotype, number based on paratypes); gena right angled posteroventrally (cf. Fig. 2d). *Mesosoma.* Notauli deeply impressed (cf. Fig. 7d); median longitudinal ridge of scutum present (cf. Fig. 7d); scutellar furrow with median carinae (cf. Fig. 7d); apex of scutellum with irregular, transverse ridge (cf. Fig. 7a); sternaulus foveolate, 0·5 × length of mesopleuron (cf. Fig. 5c); border between metepisternum and metepimeron crenulate (cf. Fig. 5d); metapleuron mostly smooth with weak crenulae on ventral margin; propodeum mostly smooth with posterior transverse carina weakly indicated (cf. Fig. 10e); mid tibia with 1 preapical spine; hind tibia with 4 apical spines; hind femur rugose ventrally (cf. Fig. 3c), 4·3 × longer than wide. *Metasoma.* 1st tergum evenly convex, without distinct bump anteriorly (cf. Fig. 14b); 1st tergum 1·5 × longer than wide; 2nd plus 3rd tergum 1·6 × longer than wide; 2nd tergum with weak transverse depression (cf. Fig. 14b); 3rd tergum lacking transverse depression (cf. Fig. 14d); ovipositor 0·8 × body length, 2·9 × length of hind femur.

Length. 7·0 mm.

Variation. Metasoma can be mostly black; melanic portions of body vary from brown to black; hind femur sometimes brown medially, posterior transverse carina of propodeum sometimes complete; length 5·9–7·1 mm.

Distribution and Material examined. Map 3. Scattered distribution on the periphery of the Amazon Basin.

Holotype ♀, **Peru**: Cuzco, Sicuani (TMB).

Determined specimens are deposited in the following institutions: AEI, BMNH, CNC, MCZ, TMB, USC.

Alabagrus chimu sp. n.

(Map 4)

Holotype ♀. *Colour.* Black except palpi, fore and mid tarsi yellow and metasoma mostly orange, darkening apically; fore wing yellowish hyaline in basal half, infuscate distally (cf. Fig. 20e).

Head. Antenna with 39 flagellomeres; gena rounded laterally (cf. Fig. 2b). *Mesosoma.* Notauli deeply impressed (cf. Fig. 9b); scutum with weak median longitudinal ridge (cf. Fig. 9b); scutellar furrow with weak median carina (cf. Fig. 7d); apex of scutellum with smooth transverse ridge (cf. Fig. 7c); median areola of metanotum weakly excavated, posterior margin not raised (cf. Fig. 9a); sternaulus foveolate, 0·5 × length of mesopleuron (cf. Fig. 4a); border between metepisternum and metepimeron crenulate (cf. Fig. 5d); metapleuron mostly smooth with crenulae along ventral margin; propodeum punctate in anterior half, areolate posteriorly; anterior median areola and anterior transverse carina weak (similar to Fig. 10d but lacking carina in anterior half); mid tibia with 6 preapical spines; hind tibia with 8 apical spines; hind femur with large punctures ventrally (cf. Fig. 3b); hind femur 3·8 × longer than wide. *Metasoma.* 1st tergum with elongate anteromedial bump (cf. Fig. 14a); 1st tergum 1·1 × longer than wide; 2nd plus 3rd tergum 1·2 × longer than wide; 2nd tergum with weak transverse depression (cf. Fig. 14b); 3rd tergum lacking transverse depression (cf. Fig. 14d); ovipositor 0·9 × body length, 3·6 × length of hind femur.

Length. 7·0 mm.

Distribution and Material examined. Map 4. Known only from the type locality, Lambayeque, Peru.

Holotype ♀, **Peru**: Lambayeque, 4 km N. Jayanca, 10.v.1983 (*Vardy*) (BMNH).

Alabagrus coatlicue sp. n.

(Map 20)

Holotype ♀. *Colour.* Black and orange; orange as follows: palpi, metapleuron, propodeum, fore tarsus, hind coxa except outer surface, hind femur in distal two-thirds, hind tibia except distal fifth, and metasoma; fore wing infuscate (cf. Fig. 16).

Head. Antenna with ? flagellomeres (antennae broken); gena right angled posteroventrally (cf. Fig. 2d). *Mesosoma.* Notauli deeply impressed (cf. Fig. 7d); scutum with median longitudinal ridge (cf. Fig. 7d); scutellar furrow with weak, median, longitudinal carina (cf. Fig. 7d); apex of scutellum with transverse, rugose ridge (c.f. Fig. 8d); sternaulus reduced, represented by 2 large foveae posteroventrally (cf. Fig. 5a); border between metepisternum and metepimeron crenulate (cf. Fig. 5d); metapleuron mostly smooth with some crenulae along margins (cf. Fig. 5f); propodeum areolate, all carinae present and well defined (cf. Fig. 7d); mid tibia with 1 preapical spine; hind tibia with 5 or 6 apical spines; hind femur rugose ventrally (cf. Fig. 3c), 3·2 × longer than wide. *Metasoma.* 1st tergum with long median carina (cf. Fig. 13a); 1st tergum as long as wide; 2nd plus 3rd tergum 1·1 × longer than wide; 2nd tergum with transverse depression (cf. Fig. 14d); 3rd tergum lacking transverse depression (cf. Fig. 14d); ovipositor 0·4 × as long as body, 2·1 × as long as hind femur.

Length. 10·0 mm.

Distribution and Material examined. Map 20. Known only from the type locality in Tabasco.

Holotype ♀, **Mexico**: Tabasco, Teapa, 29.vi.1964 (*Pallister*) (AMNH).

Alabagrus cocto sp. n.

(Map 19)

Holotype ♀. *Colour.* Orange except black as follows: head except palpi, propleuron, fore and mid leg except tarsi; hind coxa distolaterally, hind trochanter, hind tibia distally and hind tarsus; fore wing yellowish hyaline basally, gradually becoming infuscate apically (cf. Fig. 19a, but with much smaller infuscate area apically).

Head. Antenna with 46 flagellomeres; gena acute posteroventrally (cf. Fig. 2e). *Mesosoma.* Notauli deeply impressed (cf. Fig. 7d); median longitudinal ridge of scutum well defined (cf. Fig. 7d); scutellar furrow smooth, lacking longitudinal carinae (cf. Fig. 8a); apex of scutellum with weak transverse ridge (cf. Fig. 7b); sternaulus foveolate, 0·5 × length of mesopleuron (cf. Fig. 4a); border between metepisternum and metepimeron crenulate (cf. Fig. 5d); metapleuron mostly smooth with crenulae on margins (cf. Fig. 5c); propodeum areolate (cf. Fig. 7d); mid tibia with 2 preapical spines; hind tibia with 4 apical spines; hind femur smooth ventrally (cf. Fig. 3e), 4·0 × longer than wide. *Metasoma.* 1st tergum with weak longitudinal bump anteromedially (cf. Fig. 14a); 1st tergum 1·1 × longer than wide; 2nd plus 3rd tergum 1·3 × longer than wide; 2nd tergum with transverse depression (cf. Fig. 14d); 3rd tergum lacking transverse depression (cf. Fig. 14d); ovipositor 0·7 × body length, 2·5 × length of hind femur.

Length. 8·3 mm.

Variation ♀. Both paratypes as in holotype except: fore wing without yellow hue basally, i.e., clear; antenna with 42 flagellomeres; sternaulus composed of large foveae.

Distribution and Material examined. Map 19. Costa Rica and Panama.

Holotype ♀, **Panama**: El Valle, xi.1946 (*Krauss*) (USNM).

Paratypes. **Costa Rica**: 1 ♀, Bataan, 24.iv.1957 (*Shenefelt*) (SC). **Panama**: 1 ♀, Canal Zone, Summit, i.1947 (*Krauss*) (USNM).

Alabagrus cora sp. n.

(Map 10)

Holotype ♀. *Colour.* Orange, black and yellow; fore and mid tarsi yellow; orange as follows: metanotum, mesepimeron, propodeum, metapleuron, hind coxa, hind femur, one distal and one proximal spot on hind tibia; scattered areas of hind tarsus, and entire metasoma; fore wing infuscate (cf. Fig. 16).

Head. Antenna with about 40 flagellomeres (antennae broken on type); gena rounded posteroventrally (cf. Fig. 2b). *Mesosoma.* Notauli well impressed (cf. Fig. 7d); scutum with median longitudinal ridge (cf. Fig. 7d); scutellar furrow with median ridge (cf. Fig. 7d); apex of scutellum with strong transverse ridge (cf. Fig. 7a); sternaulus foveolate, 0·5 × length of mesopleuron (cf. Fig. 4a); border between metepisternum and metepimeron crenulate (cf. Fig. 5d); metapleuron with several rugae ventrally and on margins (cf. Fig.

5e); propodeum areolate, anterior transverse carina complete (cf. Fig. 7d); mid tibia with 1 preapical spine; hind tibia with 5 apical spines; hind femur rugose ventrally (cf. Fig. 3c), 3·9 × longer than wide. *Metasoma.* 1st tergum with well-defined median longitudinal ridge in anterior half (cf. Fig. 13d); 1st tergum 1·3 × longer than wide; 2nd plus 3rd tergum 1·3 × longer than wide; 2nd tergum with weak transverse depression (cf. Fig. 14d); 3rd tergum without transverse depression (cf. Fig. 14d); ovipositor 0·5 × body length; 1·8 × length of hind femur.

Length. 6·5 mm.

VARIATION ♀. The sole paratype is essentially as in the holotype.

DISTRIBUTION AND MATERIAL EXAMINED. Map 10. Southern Mexico.

Holotype ♀, **Mexico**: Jalisco, 14 km S. Guadalajara, 29.vii.1965 (*Evans*) (MCZ).

Paratype. **Mexico**: Morelos: 1 ♀, Lagos de Moreno, 12.viii.1954 (*Dreisbach*) (USNM).

Alabagrus cuna sp. n.

(Map 22)

HOLOTYPE ♀. *Colour.* Yellow except brownish black as follows: head except palpi, hind trochanter, hind tibia distally and hind tarsus; fore wing yellow basally with sharply delimited infuscate band in distal third (cf. Fig. 19d).

Head. Antenna with 34 flagellomeres; gena acute posteroventrally (cf. Fig. 2e). *Mesosoma.* Notauli deeply impressed (cf. Fig. 7d); median longitudinal ridge of scutum well defined (cf. Fig. 7d); scutellar groove smooth, lacking longitudinal carinae (cf. Fig. 8a); posterior surface of scutellum granulorugose; apex of scutellum with weak transverse ridge (cf. Fig. 8d); sternaulus represented by 2 foveae posteroventrally and smooth groove 0·5 × length of mesopleuron (cf. Fig. 5d); border between metepisternum and metepimeron crenulate (cf. Fig. 5d); metapleuron smooth except for several crenulae on ventral margin; propodeum completely areolate (cf. Fig. 7d); mid tibia with 2 preapical spines; hind tibia with 3 apical spines; hind femur weakly rugose ventrally (cf. Fig. 3g, but slightly rougher), 4·1 × longer than wide. *Metasoma.* 1st tergum with small anteromedial bump (cf. Fig. 14); 1st tergum 1·3 × longer than wide; 2nd plus 3rd tergum 1·1 × longer than wide; neither 2nd nor 3rd tergum with transverse depression (cf. Fig. 15a); ovipositor 0·5 × body length, 3·4 × length of hind femur.

Length. 5·6 mm.

DISTRIBUTION AND MATERIAL EXAMINED. Map 22. Known only from the type locality in Panama.

Holotype ♀, **Panama**: Canal Zone, Barro Colorado Island, 22.xii.1928 (AMNH).

Alabagrus diegeli sp. n.

(Map 20)

HOLOTYPE ♀. *Colour.* Black, orange, reddish orange, and yellow; palpi, fore and mid tarsus and tegula all yellow; reddish orange as follows: propodeum, mesopleuron dorsally; hind coxa, hind femur and hind tibia proximally, metasomal terga 1, 2 and 3; orange as follows: median parts of all three lobes of scutum, metanotum, metasoma except for terga 1 to 3 and tergum 8; remainder of body black; fore wing infuscate, lighter basally (cf. Fig. 18e).

Head. Antenna with 42 flagellomeres; gena rounded posteroventrally (cf. Fig. 2b). *Mesosoma.* Notauli well impressed (cf. Fig. 7d); scutum with median longitudinal ridge (cf. Fig. 7d); scutellar furrow with weak median ridge (cf. Fig. 7d); apex of scutellum with weak, rugose, transverse ridge (cf. Fig. 7b); median areola of metanotum not deeply excavated and lacking elevated posterior margin (cf. Fig. 9a); sternaulus foveolate, 0·6 × length of mesopleuron (cf. Fig. 4a); border between metepisternum and metepimeron crenulate (cf. Fig. 5d); metapleuron mostly smooth with crenulate margins (cf. Fig. 5e); propodeum areolate, anterior transverse carina weak, mostly absent (cf. Fig. 9b), mid tibia with 5 preapical spines, hind tibia with 9 apical spines; hind femur smooth ventrally (cf. Fig. 3e), 3·6 × longer than wide. *Metasoma.* 1st tergum with anteromedial bump (cf. Fig. 15d); 1st tergum 1·1 × longer than wide; 2nd plus 3rd tergum 1·3 × longer than wide; 2nd tergum with transverse depression; 3rd tergum lacking transverse depression (cf. Fig. 14d); ovipositor 0·8 × body length, 3·3 × length of hind femur.

Length. 7·9 mm.

VARIATION ♀. Coloration varies considerably; some specimens brown (where holotype is black) and brownish yellow (where holotype is orange or reddish orange); scutum often completely black, antenna slightly lighter than head (this is somewhat apparent in holotype); orange colour of holotype usually

reddish orange, i.e. metasoma unicolorous; fore wing infuscate (cf. Fig. 16); posterior border of median areola of metanotum usually lacking (cf. Fig. 9a), rarely complete but weak (cf. Fig. 8a); posterior transverse carina of propodeum often lacking between lateral longitudinal carinae; length 6·7–8·6 mm.

Distribution and Material examined. Trinidad. Map 20.

Holotype ♀, **Trinidad**: Curepe, 29.xii.1977 (*Mason*) (CNC).

Paratypes. **Trinidad**: 4 ♀, Curepe, xi.–xii.1977 (CNC); 1 ♀, Curepe, 29.xii.1952 (*Simmonds*) (CNC); 1 ♀, St Augustine, viii.1976 (BMNH).

Alabagrus elatoscutum sp. n.

(Figs 2f, 5f, 9b, 13a, Map 7)

Holotype ♀. *Colour.* Black except as follows: fore tarsus, mesepimeron, metapleuron, propodeum, hind coxa, part of hind femur and first 3 metasomal terga all orange; fore wing infuscate (cf. Fig. 16).

Head. Antenna with 32 flagellomeres; gena rounded and expanded posteroventrally (Fig. 2f). *Mesosoma.* Notauli well impressed (Fig. 9b); middle lobe of scutum highly elevated, sloping sharply towards pronotum anteriorly (Fig. 5f); scutum with weak, median, longitudinal ridge (Fig. 9b); scutellar furrow with strong, median longitudinal carina (Fig. 9b); apex of scutellum with transverse, rugose ridge (Fig. 9b); sternaulus reduced, represented by 2 large foveae posteroventrally (Fig. 5f); border between metepisternum and metepimeron crenulate (cf. Fig. 5d); metapleuron mostly smooth with crenulae along margins (Fig. 5f); propodeum areolate, anterior transverse carina weak laterally (Fig. 9b); mid tibia with 5 preapical spines; hind tibia with 10 apical spines; hind femur smooth ventrally (cf. Fig. 3e), 3·5 × longer than wide. *Metasoma.* 1st tergum with strong, long, median longitudinal carina (Fig. 13a); 1st tergum 1·2 × longer than wide; 2nd plus 3rd tergum 1·3 × longer than wide; 2nd tergum with deep transverse depression; 3rd tergum with shallow transverse depression (Fig. 13a); ovipositor 0·7 × body length, 2·6 × length of hind femur.

Length. 6·2 mm.

Allotype ♂. As in holotype ♀ except as follows: body all yellow except antenna, hind trochanter and tarsus and metasoma apically, all black; antenna with 33 flagellomeres; 1st tergum of metasoma about as wide as long; 2nd plus 3rd tergum as wide as long.

Variation ♀ ♂. Colour variable, males usually lighter than females; anterior portion of mesosoma, anterad metapleuron and propodeum, varies from yellow, to mottled, to black; anterior transverse carina of propodeum can be totally absent; length, 5·3–6·2 mm.

Distribution and Material examined. Map 7. Northern South America, from Ecuador east to Surinam and Para.

Holotype ♀, **Ecuador**: Napo, Limoncocha, 1.v.1974 (*Drummond*) (FSCA).

Paratypes. **Brazil**: Para: 1 ♀, Rio Acara, 1930 (*Horvath*) (TMB). **Colombia**: Caqueta: 1 ♂, Rio Orteguaza nr Rio Peneya, 14.–18.i.1969 (*Duckworth & Dietz*) (USNM). **Ecuador**: allotype ♂, Napo, Limoncocha, 25.iv.1974 (*Drummond*) (FSCA); Napo: 9 ♀, 41 ♂, Limoncocha, on Rio Napo, 9.i.–1.v.1974 (*Drummond*) (FSCA). **Guyana**: 1 ♂, Bartica, 16.iv.1913 (CU). **Surinam**: 1 ♀, Paramaribo, Dhoeiki Rd., 21.iv.1963 (*Van der Vecht*) (RNHL). **Venezuela**: Bolivar: 1 ♂, Paraitepuy, 16.xii.1940 (*Anduze*) (CU).

Alabagrus ekchuah sp. n.

(Fig. 11f, Map 21)

Holotype ♀. *Colour.* All black except: fore tarsus brownish black; venter of metasoma reddish black; fore wing deeply infuscate (cf. Fig. 16).

Head. Antenna with 50 flagellomeres; gena rounded posteroventrally (cf. Fig. 2b). *Mesosoma.* Notauli well impressed (cf. Fig. 7d); scutum with anteromedial longitudinal ridge (cf. Fig. 7d); scutellar groove with well-defined median longitudinal carina (cf. Fig. 8c); apex of scutellum with well-defined transverse ridge (cf. Fig. 7a); sternaulus foveolate, reaching epicnemium (cf. Fig. 4c but stronger anteriorly); mesopleuron below sternaulus heavily punctate; border between metepisternum and metepimeron crenulate (cf. Fig. 5d); metapleuron smooth medially and rugose to crenulate peripherally (cf. Fig. 5e); propodeum areolate, anterior median areola and anterior transverse carina lacking (cf. Fig. 8c); mid tibia with 5 preapical spines; hind tibia with 6 apical spines; hind femur rugose ventrally (cf. Fig. 3c), 3·4 × X longer than wide. *Metasoma.* 1st tergum with weak rounded median longitudinal ridge anteriorly (cf. Fig. 14d); 1st tergum 1·4 × longer than wide; 2nd plus 3rd tergum 1·6 × longer than wide; 2nd tergum with

transverse depression (cf. Fig. 14d); 3rd tergum lacking transverse depression (cf. Fig. 14d); ovipositor 0·8 × body length, 2·8 × length of hind femur.

Length. 10·9 mm.

ALLOTYPE ♂. As in ♀ holotype except: fore and mid tarsi yellow; ventral half of metapleuron rugose; propodeum with anterior areola; and with several transverse carinae anterolaterally (cf. Fig. 8a).

VARIATION ♀ ♂. Mesosoma deep reddish black ventrally; length 10·5–11·9 mm.

DISTRIBUTION AND MATERIAL EXAMINED. Map 21. Known from west-central Mexico south-east in deciduous forest to north-western Costa Rica.

Holotype ♀, **Costa Rica**: Guanacaste, Santa Rosa Park, 6.vii.1978 (*Janzen*) (AEI).

Paratypes. **Costa Rica**: allotype ♂, same data as holotype except 30.viii.1977; 1 ♂, same data as holotype except 13.vi.1978; 1 ♂, same data as holotype except 1.–15.vi.82 (BMNH); 1 ♂, 1 ♀, same locality as holotype, 1.–15.vi.1982 and 15.–31.vii.1982 (*Janzen & Hallwachs*) (CNC, BMNH). **El Salvador**: 1 ♀, Santa Tecla, x.1959 (*Krauss*) (USNM). **Mexico**: Nayarit: 1 ♀, vic. Compostela, 30.vii.1934 (AEI).

Alabagrus erythromelas (Brullé) comb. n.

(Fig. 6f, Map 4)

Agathis erythromelas Brullé, 1846: 503. Holotype ♂, FRENCH GUIANA (MNHP) [examined].

HOLOTYPE ♂. *Colour.* Black and orange except palpi, fore and mid tarsi yellow; orange as follows: hind coxa, hind femur, propodeal pseudosternite; metasoma except distal fifth; most of mesosoma, especially posteriorly, with reddish tinge; fore wing infuscate (cf. Fig. 16).

Head. Antenna with about 40 flagellomeres (antennae broken on holotype); gena acute posteroventrally (cf. Fig. 2e). *Mesosoma.* Notauli deeply impressed (cf. Fig. 9b); scutum with median longitudinal ridge weakly indicated anteriorly (cf. Fig. 9b); scutellar furrow smooth, with weak carina indicated posteriorly (cf. Fig. 7c); apex of scutellum with transverse, rugose ridge (cf. Fig. 7a); median areola of metanotum deeply excavated with well-defined posterior margin (Fig. 6f); sternaulus foveolate, 0·5 × length of mesopleuron (cf. Fig. 4a); border between metepisternum and metepimeron crenulate (cf. Fig. 5d); metapleuron smooth, with crenulae along ventral margin (cf. Fig. 4e); propodeal sculpture reduced, only median longitudinal and posterior transverse carinae present (Fig. 6f); mid tibia with 2 preapical spines; hind tibia with 3 apical spines; hind femur smooth ventrally (cf. Fig. 3e), 3·7 × longer than wide. *Metasoma.* 1st tergum convex with small bump anteromedially (cf. Fig. 14a); 1st tergum 1·2 × longer than wide, 2nd plus 3rd tergum 1·2 × longer than wide, 2nd tergum with transverse depression (cf. Fig. 14d); 3rd tergum lacking transverse depression (cf. Fig. 14d).

Length. 6·3 mm.

FEMALE. As in holotype ♂ except as follows: propodeum from almost completely smooth (cf. Fig. 10a) to as in ♂ holotype; usually propodeal sculpture weaker than in males; ovipositor 0·7 × body length, 2·5 × length of hind femur.

VARIATION ♀ ♂. Colour consistent except hind tibia varies from orange to black; propodeal sculpture from completely smooth (cf. Fig. 10a) to as in ♂ holotype (cf. Fig. 6f); 1st metasomal tergum from evenly, weakly convex to possessing distinct bump anteromedially (cf. Fig. 15d); length 5·7–7·1 mm.

DISTRIBUTION AND MATERIAL EXAMINED. Map 4. The periphery of the Amazon Basin.

Holotype ♂, **French Guiana**: Leprieur (MNHP).

Specimens that I have determined are deposited in the following institutions: BMNH, CNC, CU, IML, RNHL, SC, ZMHN.

Alabagrus esenbeckii (Spinola) comb. n.

(Map 4)

Agathis esenbeckii Spinola, 1840: 192–193. Holotype ♂, FRENCH GUIANA (MIZT) [examined].

HOLOTYPE ♂. *Colour.* Mostly yellowish orange with some black; black as follows: head except palpi, pronotum, propleuron, fore and mid legs basal to tibiae, hind coxa medially, hind trochanter, hind femur and tibia apically, apical fifth of metasoma; fore wing banded from base as follows: yellow, infuscate, yellow, infuscate (cf. Fig. 18d).

Head. Antenna with 50 flagellomeres; gena rounded posteroventrally (cf. Fig. 2b). *Mesosoma.* Notauli

weakly impressed (cf. Fig. 8c); scutum lacking median longitudinal ridge (cf. Fig. 8c); scutellar furrow smooth, lacking longitudinal carinae (cf. Fig. 8a); apex of scutellum smooth, lacking transverse ridge (cf. Fig. 8a); sternaulus completely absent, no foveae on metapleuron posteroventrally (cf. Fig. 4d, but even posterior areola lacking); border between metepisternum and metepimeron smooth, lacking longitudinal carinae (cf. Fig. 4f); metapleuron smooth (cf. Fig. 81d), propodeum smooth (cf. Fig. 10c), no carinae separating them; mid tibia lacking preapical spines; hind femur smooth ventrally. *Metasoma.* 1st tergum convex (cf. Fig. 14b), 1·5 × longer than wide; 2nd tergum with weak transverse depression (cf. Fig. 14b); 3rd tergum lacking transverse depression (cf. Fig. 14d); 2nd plus 3rd tergum 1·4 × longer than wide; ovipositor 0·9 × body length.

Length. 9·8 mm.

Remarks. The following parts are missing from the holotype: all right legs, left hind leg, right hind wing.

Distribution and Material examined. Map 4. Known only from the type locality in French Guiana.

Holotype ♀, **French Guiana**: Cayenne, Leprieur (MIZT).

Alabagrus festivus (Enderlein) **comb. n.**

(Map 12)

Astiria festiva Enderlein, 1920: 208. Holotype ♀, Brazil (MZP) [examined].

Holotype ♀. *Colour.* Yellowish orange, black and brown; predominantly yellowish orange; black as follows: head except yellow palpi, propleuron and anterior half of pronotum, portions of 2nd and 3rd metasomal segments and metasoma terminally; metapleuron brown; propodeum brown posteriorly, lighter (yellowish brown) anteriorly; fore and mid femora brown medially; all coxae brown laterally at least in part; fore wing banded from base as follows: yellow, infuscate, yellow, infuscate (cf. Fig. 18d).

Head. Antenna with 50 to 53 flagellomeres (antennae broken on type), gena rounded posteroventrally (cf. Fig. 2b). *Mesosoma.* Notauli weakly impressed (cf. Fig. 8c); scutum anteriorly with very weak median longitudinal ridge (cf. Fig. 9b); scutellar furrow smooth, lacking logitudinal carina (cf. Fig. 8a); apex of scutellum smooth, lacking transverse ridge (cf. Fig. 8a); median areola of metanotum lacking elevated posterior border (cf. Fig. 5b); sternaulus completely absent, no foveae on mesopleuron posteroventrally (similar to Fig. 4d but lacking trace of posterior fovea); suture between metepisternum and metepimeon smooth, lacking longitudinal carinae (cf. Fig. 4f); metapleuron smooth (cf. Fig. 4f); propodeum smooth (cf. Fig. 10c), carina separating metapleuron and propodeum weak, present in posterior fifth only; mid tibia lacking preapical spines (hind tibiae broken on type); hind femur smooth ventrally (cf. Fig. 3e), 3·7 × longer than wide. *Metasoma.* 1st tergum convex (cf. Fig. 14b); 1st tergum 1·7 × longer than wide; 2nd plus 3rd tergum 1·5 × longer than wide, 2nd tergum with strong transverse depression (cf. Fig. 14d); 3rd tergum lacking transverse depression (cf. Fig. 14d); ovipositor 0·9 × body length; 4·0 × length of hind femur.

Length. 11·1 mm.

Variation ♀. Antennal flagellomeres pale yellow to black; mesopleuron yellowish orange to brown, propodeum yellowish orange to brown; 2nd metasomal tergum completely yellowish orange to partially black posteriorly; mid tibia with 0–2 preapical spines; hind tibia with 6 apical spines.

Remarks. The following parts of the holotype are absent or broken: both antennae, right hind leg, left hind leg except coxa, and both ovipositor sheaths.

Distribution and Material examined. Map 12. Known only from Obidos, Brazil and Cuzco, Peru. Probably rare but widespread in the north and central Amazon Basin and on the eastern slopes of the Andes.

Holotype ♀, **Brazil**: Para, Obidos (MZP).

Other specimens that I have determined are in the following institutions: SC, MZP.

Alabagrus fuscistigma Enderlein

(Map 14)

Alabagrus fuscistigma Enderlein, 1920: 204. Holotype ♂, Brazil (MZP) [examined].

Holotype ♂. *Colour.* Yellow, brown and black; vertex and frons black; most of body yellow except brown as follows: antenna except scape anteriorly, hind coxa distally, hind trochanter, hind femur in distal fifth, hind tibia except medially, hind tarsus, most of metasoma except 1st and 2nd terga; metasoma darker distally; fore wing infuscate with basal area and large area around stigma clear, stigma yellow (cf. Fig. 20c).

Head. Antenna with 38 to 40 flagellomeres (broken on holotype, numbers based on conspecific material); gena right angled posteroventrally (cf. Fig. 2d). *Mesosoma.* Notauli deeply impressed (cf. Fig. 9b); scutum with weak median longitudinal ridge anteriorly (cf. Fig. 9b); scutellar furrow with median longitudinal carina (cf. Fig. 9b); apex of scutellum (posterior) with strong transverse ridge (cf. Fig. 9b); sternaulus foveolate 0·5 × length of mesopleuron (cf. Fig. 5c); border between metepisternum and metepimeron crenulate (cf. Fig. 5d); metapleuron mostly smooth with some rugae ventrally and on margins (cf. Fig. 5c); propodeum areolate (cf. Fig. 7d, though lateral longitudinal carinae weaker posteriorly); mid tibia with 2 preapical spines; hind tibia with 3 apical spines; hind femur punctate ventrally (intermediate between Figs 3a and 3b), 4·2 × longer than wide. *Metasoma.* 1st tergum convex (cf. Fig. 14b); 1st tergum 1·6 × longer than wide; 2nd plus 3rd tergum 1·5 × longer than wide; 2nd tergum with weak transverse depression (cf. Fig. 14d); 3rd tergum lacking transverse depression (cf. Fig. 14d).

Length. 5·3 mm.

DISTRIBUTION AND MATERIAL EXAMINED. Map 14. Colombia, Peru and south-eastern Brazil, presumably more widespread.

Holotype ♂, **Brazil** (MZP).

Determined specimens are deposited in the following institutions: AMNH, CNC, MCZ, MZP.

Alabagrus guayaki sp. n.

(Fig. 17e, Map 7)

HOLOTYPE ♀. *Colour.* Orange to orange-red except as follows: head black except palpi yellow and antennal flagellomeres brown, propleuron black, fore trochanter and fore femur in basal half black; mid coxa with black spot outwardly, mid trochanter and most of mid femur black, fore and mid tibiae and tarsi yellow, 9th metasomal tergum brown; fore wing infuscate with stigmal area yellow (Fig. 17e).

Head. Antenna with 39 flagellomeres; gena rounded posteroventrally (cf. Fig. 2b). *Mesosoma.* Notauli weakly impressed (cf. Fig. 8c); scutum lacking median longitudinal ridge (cf. Fig. 8c); scutellar furrow lacking longitudinal carinae (cf. Fig. 8a); apex of scutellum smooth, transverse ridge weakly indicated (cf. Fig. 7d); sternaulus foveolate, 0·5 × length of mesopleuron; border between metepisternum and metepimeron crenulate (cf. Fig. 5d); metapleuron with rugae or crenulae along margins (cf. Fig. 5e); propodeum weakly areolate, mostly smooth in anterior two-thirds, anterior areola and anterior transverse carina mostly absent (cf. Fig. 9a); mid tibia lacking preapical spines; hind tibia with 4 apical spines; hind femur smooth ventrally (cf. Fig. 3e), 4·3 × longer than wide. *Metasoma.* 1st tergum convex (cf. Fig. 14b); 1st tergum 1·6 × longer than wide; 2nd plus 3rd tergum 1·7 × longer than wide; 2nd tergum with weak median transverse depression (cf. Fig. 14b); 3rd tergum lacking transverse depression (cf. Fig. 14d); ovipositor 0·8 × body length, 2·6 × length of hind femur.

Length. 6·7 mm.

ALLOTYPE ♂. As in holotype ♀ except as follows: fore and mid trochanters and femora pale brown and yellow; scutellar furrow with median longitudinal carina (cf. Fig. 7d); propodeum areolate with anterior areola and anterior transverse carina complete (cf. Fig. 7d); fore wing partly clear basally (cf. Fig. 91c); 1st metasomal tergum with distinct, longitudinal bump (cf. Fig. 14b); length 6·1 mm.

VARIATION ♂ ♀. Pronotum yellow-orange to black, mesopleuron rarely brown-black anteriorly (5%); fore wing patterns of holotype and allotype can occur in either sex; fore and mid legs entirely yellow (20%); mid tibia rarely (5%) with 1 preapical spine; length of ♀ 6·3–7·4 mm; length of ♂ 5·1–6·7 mm.

DISTRIBUTION AND MATERIAL EXAMINED. Map 7. Known only from the type locality in Santa Catarina, Brazil.

Holotype ♀, **Brazil**: Santa Catarina, Nova Teutonia, 7.v.1952 (*Plaumann*) (BMNH).

Paratypes. Allotype ♂, same data as holotype except 6.iv.1938; 11 ♀, 50 ♂, same locality as holotype, i.–iv. and xii., 1937–1936 (AEI, BMNH, CNC).

Alabagrus haenschi (Enderlein) comb. n.

(Fig. 4f, Map 3)

Astiria haenschi Enderlein, 1920: 207. Holotype ♀, GUYANA (MZP) [examined].

HOLOTYPE ♀. *Colour.* Black, orange and yellow; black as follows: head except palpi, body of mesosoma, hind coxa laterally and hind tarsus; yellow as follows: palpi, tegula, all legs except as described above;

anterior two-thirds of metasoma orange with some melanic mottling; fore wing banded from base as follows: yellow, infuscate, yellow, infuscate (cf. Fig. 20a).

Head. Antenna with 44 flagellomeres, gena acute posteroventrally (cf. Fig. 2e). *Mesosoma.* Notauli deeply impressed (cf. Fig. 7d); median longitudinal ridge of scutum present (cf. Fig. 7d); scutellar furrow smooth, lacking longitudinal carinae (cf. Fig. 8a); apex of scutellum smooth, lacking transverse ridge (cf. Fig. 8a); median areola of metanotum shallow, lacking raised posterior margin (cf. Fig. 9a); sternaulus weak, restricted to several foveae posteroventrally (Fig. 4f); metapleuron smooth (Fig. 4f); suture between metepimeron and metepisternum smooth (Fig. 4f); propodeum smooth (cf. Fig. 10c); mid tibia with 3 preapical spines; hind tibia with 3 apical spines; hind femur smooth ventrally (cf. Fig. 3e), 4·6 × longer than wide. *Metasoma.* 1st tergum evenly convex, without distinct bump anteriorly (cf. Fig. 14b); 1st tergum 1·4 × longer than wide; 2nd plus 3rd tergum 1·7 × longer than wide; 2nd tergum with weak transverse depression (cf. Fig. 14b); 3rd tergum lacking transverse depression (cf. Fig. 14d); ovipositor 0·9 × body length, 3·2 × longer than hind femur.

Length. 8·8 mm.

Male. Essentially as in female, not more heavily sculptured.

Variation ♀ ♂. Colour varying from that of holotype to much lighter with most of mesosoma yellow; hind femur often (50%) black; posterior transverse ridge of scutellum weak or absent (cf. Figs 7d and 8a); median areola of metanotum sometimes with weak posterior margin (cf. Fig. 8a); rarely sternaulus longer than that of holotype, up to 0·5 length of mesopleuron (cf. Fig. 5c); carinae on metepimeral-metepisternal suture very weak (cf. Fig. 5d) or absent (cf. Fig. 4f); ovipositor varying from 2·9–4·9 × longer than hind femur.

Distribution and Material examined. Map 3. Widespread in South America, from Trinidad west to Peru and east and south to Espirito Santo, Brazil.

Holotype ♀, **Guyana**: Demerara, ii.–iii.1904 (*Haensch*) (MZP).

Identified specimens of this species are deposited in the following institutions: AEI, AMNH, BMNH, CNC, MCZ, RNHL, SC, ZMHB.

Alabagrus imitatus (Cresson) **comb. n.**

(Figs 4b, 7b, 13c, Map 20)

Microdus imitatus Cresson, 1873: 51. Holotype ♀, U.S.A. (ANSP) [examined].
Microdus nigrotrochantericus Viereck, 1905: 275. Holotype ♀, U.S.A. (SMEK) [examined]. **Syn. n.**
Bassus floridanus Muesebeck, 1927: 31. Holotype ♂, U.S.A. (USNM) [examined]. **Syn. n.**

Holotype ♀. *Colour.* Brownish black and yellowish orange; brownish black as follows: head, propleuron, pronotum, mesopleuron ventrally, fore and mid legs, hind leg except coxa and femur; scutum and scutellum brown and orange, brown peripherally; fore wing infuscate (cf. Fig. 16).

Head. Antennae broken (number of flagellomeres 39 according to original description); gena rounded posteroventrally (cf. Fig. 2b). *Mesosoma.* Notauli well impressed (Fig. 7b); scutum lacking median longitudinal ridge (cf. Fig. 7b); scutellar furrow with weak median longitudinal carina (cf. Fig. 7b); apex of scutellum with well-defined, transverse, rugose, ridge (Fig. 7b); sternaulus foveolate, 0·5 × length of mesopleuron (cf. Fig. 8c); border between metepimeron and metepisternum crenulate (Fig. 4b); metapleuron rugose ventrally, becoming smooth with punctures dorsally (Fig. 4b); propodeum rugose with lateral longitudinal carinae present and anterior transverse carina indicated (Fig. 7b); mid tibia lacking preapical spines; hind tibia with 11 apical spines; hind femur mostly smooth ventrally with some rough punctures medially (cf. Fig. 3b); hind femur 3·7 × longer than wide. *Metasoma.* 1st tergum smooth with sharply defined median longitudinal carina 0·5 × length of tergum (Fig. 13c); 1st tergum 1·5 × longer than wide; 2nd plus 3rd tergum 1·5 × longer than wide; 2nd tergum with transverse depression (Fig. 13c); 3rd tergum without transverse carina (cf. Fig. 14d); ovipositor 1·4 × body length, 6·3 × length of hind femur.

Length. 8·7 mm.

Male. Similar to female except as follows: sculpture stronger everywhere, sternaulus 0·7 × length of mesopleuron; transverse ridge of scutellum more rugose (Fig. 4b); propodeum distinctly areolate with rugae within areola (cf. Fig. 8a); 1st metasomal segment with median longitudinal carina, and laterally rugose (similar to Fig. 12c but usually less rugose).

Variation ♀. This rather common species varies considerably, especially in size and coloration. I am not sure that it constitutes a single species but there seems to be continuous variation in all of the characters that are usually useful in distinguishing species of *Alabagrus*. Variation as follows: fore leg often with some

yellow, rarely all yellow; all areas that are dark brown in type can be black in other specimens; head rarely deep reddish brown, usually (95%) much darker than metasoma; mesosoma, except propodeum, metanotum, mesepimeron and metapleuron from completely black to orange-yellow; number of flagellomeres 35–45; apical transverse ridge of scutellum absent (cf. Fig. 8a) to well developed (cf. Fig. 9b); scutellum usually sloping gently to metanotum; sternaulus always well impressed though foveae can be reduced; propodeal sculpture always reduced, usually rugose medially with poorly formed areolae, becoming smooth laterally; sometimes almost smooth except for small remnants of median and lateral longitudinal carinae (cf. Fig. 7c); mid tibia with 0–4 preapical spines, hind tibia with 7–15 apical spines; 1st metasomal tergum with or without median longitudinal carina (cf. Figs 14a, 13c) and with or without short anterolateral longitudinal carinae, 1st tergum 1·4–1·6 × longer than wide; metasoma rather long and slim; ovipositor 1·4–1·5 × body length.

Variation ♂. The males are fairly homogeneous except for size and colour. They vary from 5·5–9·4 mm and their mesosomata vary from completely yellow (as in the holotype of *A. floridanus*) to black anterad propodeum.

Hosts. Two specimens from Costa Rica were reared from '*Diatraea* sp.'

Remarks. A male was originally described by Muesebeck (1927) as a separate species, *Bassus floridanus*. Indeed, males are quite different from females of *A. imitatus*. However, all of these differences, which are listed under the description of the male, are characters that are typically sexually dimorphic in other species of *Alabagrus*, e.g. *A. texanus* and *A. sanctus*. *Microdus nigrotrochantericus* Viereck is also synonymized with *A. imitatus*; the holotype of *M. nigrotrochantericus* is similar to that of *A. imitatus* except that it lacks a keel on the 1st metasomal segment. This character is highly variable in *A. imitatus* in which the 1st metasomal segment grades from completely smooth to possessing a strong median keel. Males of several species of *Alabagrus* have a keel when females do not, e.g. *A. texanus*, *A. arawak*. Muesebeck (1927) thought that *A. nigrotrochantericus* might be conspecific with *A. imitatus* but he lacked forms intermediate between the two; his suspicions were correct.

Females of *A. imitatus* are very similar to those of *A. sanctus* but they are rather easily separated on two characters. Females of *A. sanctus* have the propodeum much more areolated and the ovipositor is much smaller (1·1 v. 1·4 × body length). Males of these species are more difficult to distinguish from one another. In both species the propodeum is areolate. The only character known to distinguish them is coloration. *A. sanctus* has a dark scutum and *A. imitatus* usually has a pale scutum through this colour difference cannot be relied on to separate them. More males will have to be collected and associated with females to find characters to separate the two.

A. sanctus has a more northerly distribution than *A. imitatus* (see Maps 16 and 20). No females of *A. sanctus* have been found in the southern states of Florida, Georgia, Alabama and Mississippi, though males that fit the colour pattern of *A. sanctus* are common in Florida and Georgia where *A. imitatus* is also common. I am not sure of the identity of these males. Their distributional data leads me to believe that they are *A. imitatus* but their colour pattern suggests *A. sanctus*. Because there are some female specimens of *A. imitatus* from Florida with black scuta I have tentatively placed these males with *A. imitatus*. Several of these dark males were captured in the same locality and on the same date as females that are definitely *A. imitatus*. I might revise my opinion on the status of these dark males if females of *A. sanctus* were found to be widespread in Florida.

Distribution and Material examined. Map 20. Widespread in Mexico, Central America and the south-eastern U.S.A. as far north as Kentucky.

Specimens from temperate regions (United States of America and northern Mexico) were collected from April to October, most commonly from May to July. Tropical specimens were collected throughout the year.

Holotype ♀, *Microdus imitatus* Cresson, **U.S.A.**: Massachusetts (ANSP). Holotype ♂, *Microdus nigrotrochantericus* Viereck, **U.S.A.**: Kansas, Douglas County (SMEK). Holotype ♂, *Bassus floridanus* Muesebeck, **U.S.A.**: Florida, Biscayne Bay (USNM).

Specimens determined by me are deposited in the following institutions: AEI, AMNH, ANSP, CNC, CU, FSCA, MCZ, MSEU, TAMU, UCB, UCV, UGA, USNM.

Alabagrus intimapa sp. n.

(Map 5)

Holotype ♀. *Colour*. Orange and black; head black; mesosoma orange except lateroventrally black; metapleuron orange; fore and mid legs brownish black except tibiae and tarsi yellow; hind coxa orange

except black ventrolaterally; hind femur orange, otherwise hind leg brown to black; metasoma orange with mottled brown patches; fore wing infuscate with yellow stigmal area and semi-clear basally (cf. Fig. 19c but not as clear basally).

Head. Antenna with 39 flagellomeres; gena right angled posteroventrally (cf. Fig. 2d). *Mesosoma.* Notauli deeply impressed (cf. Fig. 7d); scutum with median longitudinal ridge well defined (cf. Fig. 7d); scutellar furrow with small median longitudinal carina (cf. Fig. 7d); apex of scutellum (posterior) with strong, rugose, transverse ridge (cf. Fig. 7d); sternaulus foveolate, about 0·5 × length of mesopleuron (cf. Fig. 4a); border between metepisternum and metepimeron crenulate (cf. Fig. 5d); metapleuron smooth (Fig. 6c); propodeum areolate, anterior transverse carina lacking, anterior areola about 7 × longer than posterior areola (cf. Fig. 9d); mid tibia with 2 preapical spines; hind tibia with 3 apical spines; hind femur with deep irregular punctures ventrally (cf. Fig. 3b); hind femur 4·5 × longer than wide. *Metasoma.* 1st tergum slightly raised anteromedially (cf. Fig. 14a), 1·7 × longer than wide; 2nd tergum 1·6 × longer than wide; 2nd tergum with transverse depression (cf. Fig. 14d); 3rd tergum lacking transverse depression (cf. Fig. 14d); ovipositor 0·8 × body length, 2·8 × length of hind femur.

Length. 7·2 mm.

Allotype ♂. As in holotype except: colour lighter, brown and yellowish orange; metasoma entirely yellowish orange; anterior transverse carina of propodeum present; length 6·3 mm.

Variation ♀ ♂. Coloration from brown and yellowish orange to black and reddish orange; rarely scutum mottled with brown or black; metasoma with or without melanic mottling; anterior transverse carina of propodeum rarely complete on male specimens (cf. Fig. 8d), never indicated on females (cf. Fig. 9d); ovipositor 8–9 × body length; length 5·6–7·2 mm.

Distribution and Material examined. Map 5. Known only from Santa Catarina, Brazil.

Holotype ♀, **Brazil**: Santa Catarina, Nova Teutonia, 27°11′S, 52°23′W 300–500 m, ii.1966 (*Plaumann*) (BMNH).

Paratypes. **Brazil**: allotype ♂, same data as holotype except 18.xii.1961 (CNC); Santa Catarina: 8 ♀, 22 ♂, Nova Teutonia, 300–500 m, iii., iv., x., xii., 1938–1968 (*Plaumann*) (BMNH, CNC); 1 ♂, Rio Grande do Sol (*Stieglmayr*) (NHMV).

Alabagrus ixtilton sp. n.

(Map 10)

Holotype ♀. *Colour.* All black except metatarsomeres brown; fore wing deeply infuscate (cf. Fig. 16).

Head. Antenna with 40 flagellomeres; gena rounded posteroventrally with obtuse angle posteriorly (cf. Fig. 2c). *Mesosoma.* Notauli well impressed; median longitudinal ridge of scutum weak (cf. Fig. 9b); apex of scutellum with strong even transverse ridge (cf. Fig. 8d); sternaulus foveolate, 0·6 × length of mesopleuron (cf. Fig. 4a); border between metepisternum and metepimeron crenulate (cf. Fig. 5d); metapleuron mostly smooth, rugose in ventral third and crenulate on margins (cf. Fig. 4a); propodeum areolate, anterior transverse carina present (cf. Fig. 7d); mid tibia with 1 preapical spine; hind tibia with 6 apical spines; hind femur mostly smooth with weak rugae (cf. Fig. 3b), 4·4 × longer than wide. *Metasoma.* 1st tergum with weak smooth longitudinal ridge anteriorly (cf. Fig. 14d); 1st tergum 1·7 × longer than wide; 2nd plus 3rd tergum 1·5 × longer than wide; 2nd tergum with weak transverse depression (cf. Fig. 14b); 3rd tergum lacking transverse depression (cf. Fig. 14d); ovipositor 0·8 × body length, 2·7 × length of hind femur.

Length. 6·8 mm.

Allotype ♂. As in ♀ holotype except: sternaulus 0·7 length of mesopleuron; length 7·5 mm.

Variation ♀ ♂. Most specimens are larger than the holotype and allotype which were chosen because they are the only pair in good condition from the same locality. Coloration usually black, rarely (8%) with scutum, pronotum and part of mesopleuron orange; sternaulus of varying lengths, always strong, never reaching epicnemium; hind femur mostly smooth to rugo-punctate ventrally; anterior areola of propodeum weak (cf. Fig. 8c), median longitudinal carina sometimes dividing anterior areola; mid tibia with 0–4 preapical spines; 1st metasomal tergum 1·4–1·7 × longer than wide; length 6·8–9·7 mm.

Distribution and Material examined. Map 10. Western and southern Mexico.

Holotype ♀, **Mexico**: Chiapas, 925 m, 32 km N. Huixtla, 5.vi.1969 (*Mason*) (CNC).

Paratypes. **Mexico**: allotype ♂, Chiapas, 925 m, 32–40 km N. Huixtla, 5.vi.1969 (*Peterson*) (CNC); Chipas: 1 ♂, 32–40 km N. Huixtla, 900 m, 4.vi.1969 (*Teskey*) (CNC); 1 ♀, Suchiapa, 18.vii.1957 (*Chemsak & Rannels*) (USNM); 1 ♀, 38 km W. Cintalapa, 12.viii.1963 (*Parker & Stange*) (USNM); 1 ♂, 24 km W.

Las Cruces, 27.vii.1952 (*Gilbert & MacNeil*) (USNM); 1 ♀, El Zapotal, 3·2 km S. Tuxtla Gutierrez, 9.vii.1957 (*Hurd*) (USNM); 1 ♂, 40 km S. Tuxtla Gutierrez, 12.viii.1963 (*Parker & Stange*) (USNM); Colima: 2 ♀, 24 km S. Colima, 370 m, viii.1962 (*Painter*) (SEI); 1 ♀, Manzanillo, 12.vii.1956 (*Dreisback*) (USNM); Guerrero; 1 ♀, Chilpancingo, 4600′ [1500 m], vii.1904 (*Smith*) (BMNH); 1 ♀, Rincon, 2800′ [920 m], x.1904 (*Smith*) (BMNH); 1 ♀, 1 ♂, Tierra Colorada, 2000′ [660 m], x.1904 (*Smith*) (BMNH); Jalisco: 1 ♀, 14 mi. [22 km] S. Antlan, 3.viii.1978 (*Plitt & Schaffner*) (TAMU); 1 ♀, Chamela, 1.–8.x.1985 (*Parker & Griswold*) (CNC); 1 ♀, Puente Barranquitas, 29 km NW. Magdalena, 900 m, 10.x.1975 (*Powell & Chemsak*) (CB); Morelos: 1 ♀, 8 km E. Cuernavaca, 16.vii.1963 (*Parker & Stange*) (USNM); 1 ♀, 5 km N. Alpugeca, 1000 m, 10.viii.1962 (*Evans*) (MCZ); 1 ♀, Yautepec, 31.vii.1963 (*Parker & Stange*) (USNM); Nayarit: 1 ♀, 1 ♂, Campostella, 16.ix.1957 (*Dreisbach*) (MSEU); 3 ♀, 2 ♂, Tepic, ix.1957 (*Dreisbach*) (MSEU); Oaxaca: 1 ♀, 69 km W. Tehuntepec, 22.viii.1963 (*Weems*) (FSCA); 1 ♀, 62 km SE. Oaxaca, 1.ix.1963 (*Painter*) (MCZ); 1 ♀, 4·8 km W. El Camaraon, 6.viii.1963 (*Parker & Stange*) (USNM); 1 ♀, 70 km W. Tehuantepec, 21.vii.1952 (UCB); Sinaloa: 1 ♀, 4 km N. Mazatlan, 11.viii.1970 (*Wasbauer*) (UCB).

Alabagrus janzeni sp. n.

(Figs 11a, 11c, Map 9)

Holotype ♀. *Colour.* Black and yellow, black as follows: head except palpi, nesosoma except metapleuron and propodeum, hind coxa basally; hind tarsus and tibia apically; metasoma except metapleuron and propodeum, hind coxa basally; hind tarsus and tibia apically; metasoma in distal third; fore wing with distinct bands, coloured from base as follows: yellow, infuscate, yellow, infuscate (cf. Fig. 18d).

Head. Antenna with 45 flagellomeres, gena acute posteroventrally (cf. Fig. 2e). *Metasoma.* Notauli well impressed (cf. Fig. 9b); scutum with very weak median longitudinal ridge (cf. Fig. 9b); scutellar furrow smooth with weak indication of median carina (cf. Fig. 7c); apex of scutellum smooth, lacking transverse ridge (cf. Fig. 8a); sternaulus well impressed with large foveae, 0·5 × length of mesopleuron (cf. Fig. 5c); border between metepisternum and metepimeron crenulate (cf. Fig. 5d); metapleuron mostly smooth with several carinae on margins (cf. Fig. 5c), propodeum smooth (cf. Fig. 10c); mid tibia with 8 preapical spines; hind tibia with 6 apical spines; hind femur smooth ventrally (cf. Fig. 3e), 4·0 × longer than wide. *Metasoma.* 1st tergum with long, smooth, longitudinal carina (cf. Fig. 11c); 1st tergum 1·4 × longer than wide; 2nd plus 3rd tergum 1·5 × longer than wide; both terga 2 and 3 with transverse depression (cf. Fig. 13b); ovipositor equal to body length, 3·9 × length of hind femur.

Length. 8·9 mm.

Variation. Costa Rican paratype essentially as in holotype; Venezuelan specimen somewhat darker and with posterior transverse carina present on propodeum (Fig. 11c).

Distribution and Material examined. Map 9. Known from Costa Rica and Venezuela but probably occurring between the two locations.

Holotype ♀, **Costa Rica**: Guanacaste, Santa Rosa Park, 19.viii.1977 (*Janzen*) (AEI).

Paratypes. **Costa Rica**: 1 ♀, Guanacaste, Santa Rosa Park, 14.ix.1977 (*Janzen*) (AEI). **Venezuela**: 1 ♀, Aragua, Rancho Grande, 1100 m, 7.vi.1951 (*Requena*) (UCV).

Alabagus jatunqepi sp. n.

(Map 11)

Holotype ♀. *Colour.* Black and orange; head including antenna black; mesosoma orange except scutellum; metanotum, most of pronotum and metapleuron, and part of mesopleuron all black; legs black, except fore tarsus, hind trochanter and parts of hind femur light brown to yellow; 1st metasomal tergum and most of 2nd tergum orange, remainder of metasoma black; fore wing infuscate except stigmal area yellow (cf. Fig. 17e).

Head. Antenna with 49 flagellomeres; gena rounded posteroventrally (cf. Fig. 2b); sharp ridge laterad clypeus; occiput deeply excavated medially; inner angle of occipital excavation sharp (cf. Fig. 1b). *Mesosoma.* Notauli weakly impressed (cf. Fig. 8c); scutum lacking median longitudinal ridge (cf. Fig. 8c); scutellar furrow smooth, lacking longitudinal carinae (cf. Fig. 8a); apex of scutellum smooth, lacking transverse ridge (cf. Fig. 8a); sternaulus composed of several small foveae posteroventrally (cf. Fig. 5a); border between metepimeron and metepisternum smooth, lacking crenulae (cf. Fig. 4f); metapleuron smooth (cf. Fig. 5d); carina between propodeum and metapleuron weak, rounded; propodeum smooth (cf. Fig. 10c); mid tibia lacking preapical spines; hind tibia with 4 apical spines; hind femur smooth ventrally (cf. Fig. 3e), 4·5 × longer than wide. *Metasoma.* 1st tergum smooth, strongly convex (cf. Fig. 14b), 1·2 ×

longer than wide; 2nd tergum with distinct transverse depression (cf. Fig. 14d); 3rd tergum lacking transverse depression (cf. 14d); 2nd plus 3rd tergum 1·3 × longer than wide; ovipositor about 1·5 × body length, 6·5 × length of hind femur.

Length. 10·7 mm.

Variation ♀. The three paratypes are similar to the holotype in most respects except minor variations in measured characters and major differences in coloration. The paratypes are coloured as follows: mesosoma black except propodeum orange; legs all dark except coxae can be yellow mesally; fore and mid legs yellow at points of articulation, tarsi yellow; hind femur partially yellow; metasoma yellow except apically black; fore wing coloration usually as in holotype, one paratype has fore wing clear basally; length 9·3–10·7 mm.

Distribution and Material examined. Map 11. Known from Panama, Colombia and Peru.

Holotype ♀, **Peru**: Cusco, Santa Isabel, Cosnipata River (part of Paucartambo River), 1700 m, 16.i.1952 (*Woytkowski*) (USNM).

Paratypes. **Colombia**: Meta: 1 ♀, Villavicencio, 450 m (*Bequaert*) (MCZ). **Panama**: 1 ♀, El Germeno, iv.–v.1939 (*Zetek*) (USNM). **Peru**: Lambayeque: 1 ♀, 1 mi [1·6 km] SW. Chiclayo, fertile irrigated region in arid coastal desert, 22.viii.1971 (*Broomfield*) (BMNH).

Alabagrus juchuy sp. n.

(Fig. 2c, Map 6)

Holotype ♀. *Colour.* Orange, black and yellow; black as follows: head (antenna slightly lighter shade) excluding palpi, prothorax, mesepisternum, scutellum medially, all leg segments except fore and mid tarsi, metasomal tergum 8; yellow as follows: palpi, tegula, fore and mid tarsi; remainder of body orange; fore wing infuscate with stigma mostly yellow and base of wing almost clear (cf. Fig. 19c).

Head. Antenna with 36 flagellomeres; gena with obtuse angle posteroventrally (cf. Fig. 2c). *Mesosoma.* Notauli well impressed (cf. Fig. 8c); scutum lacking median longitudinal ridge anteriorly (cf. Fig. 8a); scutellar furrow lacking distinct longitudinal carinae (cf. Fig. 8a); apex of scutellum smooth with some irregularities (cf. Fig. 9a); median areola of metanotum not excavated, posterior margin not elevated (cf. Fig. 9a); sternaulus foveolate, 0·4 × length of mesopleuron (cf. Fig. 5c); border between metepisternum and metepimeron crenulate (cf. Fig. 5d); metapleuron mostly smooth with crenulae ventrally and on margins (cf. Fig. 5f); propodeum areolate, anterior median areola with weak margins, anterior transverse carina weak (cf. Fig. 9a); mid tibia with 1 preapical spine; hind tibia with 3 apical spines; hind femur smooth ventrally (cf. Fig. 3e), 4·7 × longer than wide. *Metasoma.* 1st tergum with median longitudinal ridge, 0·3 × length of tergum (cf. Fig. 13d); 1st tergum 1·6 × longer than wide; 2nd tergum with weak transverse depression (cf. Fig. 14b); 3rd tergum lacking transverse depression (cf. Fig. 14d); ovipositor 0·8 × body length, 2·8 × length of hind femur.

Length. 5·2 mm.

Allotype ♂. As in the holotype ♀ except as follows: scutum and scutellum reddish brown to black, fore and mid tibiae yellowish brown, sterna and laterotergites of metasoma yellow; metapleuron rugose in ventral third (cf. Fig. 4a); propodeum completely areolate, all carinae strong (cf. Fig. 7d); 1st metasomal tergum with stronger central ridge and some rugae.

Variation ♀ ♂. Coloration varies considerably; scutum and scutellum vary from orange to black; hind femur varies from completely melanic (90%) to mostly orange; fore wing clear to infuscate basally (cf. Figs 19c, 17e), and area around stigma as well as stigma can be yellow (50%).

Distribution and Material examined. Map 6. Widespread from Costa Rica south to northern Argentina.

Holotype ♀, **Trinidad**: Curepe, 20.i.1978 (BMNH).

Paratypes. **Argentina**: Sante Fe: 2 ♀, Rosario, 24.i.1922 (*Hubrich*) (ZSBS). **Bolivia**: Beni, 2 ♀, 20 km W. Laranjeiras, 3.–5.viii.1964 (*Bouseman & Lussenhop*) (AMNH). **Brazil**: Bahia: 1 ♀, Ceara, Ser. do Araripe, 850 m, 19.v.1969 (*Alvarenga*) (AEI); 2 ♀, Itabuna, Cepec, ii.1983 and 12.–15.iii.1983 (*Benton*) (BMNH); Guanabara: 1 ♀, Est. Rio de Janeira, Silva Jardin, iii.1974 (*Oliveira*) (CNC); 5 ♀, Represa Rio Grande, vi.1967 (*Alvarenga*) (AEI); Minas Gerais: 1 ♀, 1930 (*Hambleton*) (CU); Para: 3 ♀, 1 ♂, Rio Acara, 1930 (*Horvath*) (TMB); 1 ♂, Braganza, (*Merrill*) (USNM); Parana: 1 ♂, Campina Grande nr Curitiba, 20.ii.1966, (*Townes*) (AEI); Pernambuco: 3 ♀, Carnaru, iv.1972 (*Alvarenga*) (AEI, CNC); 1 ♂, Petrolina, v.1969 (*Alvarenga*) (AEI); Sao Paulo: 1 ♂, Barueri, 13.i.1962 (*Lenko*) (NHMV). **Colombia**: Valle de Cauca: 1 ♀, Cali, Western Cordillera, [2,000 m,] 24.i.1935 (*Schwarz*) (AMNH); District Especial: 1 ♀, 1 ♂, Bogota (*Lindig*) (ZMHB); Tolima: 1 ♀, Armero, 30.ii.1977 (*Peyton*) (USNM). **Costa Rica**: 1 ♀, Turrialba, viii.1963 (*Porter*) (MCZ). **Dominica**: 1 ♂, Cassada Gardins, 19.ii.1964 (*Bray*) (USNM); 5 ♀, 2

♂, Clarke Hall, Layou Valley (*Evans*) (USNM); 2 ♂, La Plaine, 29.x.1966 (*Gurney*) (USNM); 1 ♂, 1 ♀, nr mouth of Layou River, 13.ii.1965 and 13.iii.1965 (*Evans*) (USNM); 1 ♂, Roseau, 8.iii.1965 (*Evans*) (USNM); 1 ♂, Roseau, 22.vi. (*Ross*) (MCZ); 2 ♂, Roseau Valley, 9.x.1937 (*Richards*) (BMNH); 1 ♀, 2·4 km N. Pont Casse, 12.ii.1965 (*Wirth*) (USNM); 3·2 km E. Pont Casse, 8.iv.1966 (*Gagne*) (USNM); 1 ♀, Ridgefield, xi.1963 (*Bennett*) (CIBC); 1 ♀, 6·4 km, NE. Salisbury, 650 m, 17.ii.1965 (*Evans*) (USNM); 2 ♀, S. Chiltern, 520 m, 19.ii.1965 (*Evans*) (USNM); 1 ♀, 5 ♂, Foote, vi.–vii.1913 (USNM); 1 ♂ (*Ramage*) (BMNH); 4 ♂ (BMNH). **Grenada**: 3 ♂, Balthazar (*Smith*) (BMNH, USNM); 3 ♂, 6 ♀, Mt Gay Est. (*Smith*) (BMNH, USNM); 1 ♀, St George's (*Smith*) (BMNH); 1 ♂, Vendome Est. (*Smith*) (BMNH). **Panama**: 2 ♀, Bella Vista, 7.viii.1924 (*Banks*) (MCZ); 1 ♂, Las Cumbres, 17.–30.iii.1982 (*Wolda*) (CNC). **Peru**: Cuzco: 2 ♀, 1 ♂, Quince Mil, 750 m, nr. Marcapata, 10.–15.xi.1962 (*Pena*) (AEI, SC). **Saint Vincent**: 11 ♀, 37 ♂, 1–300 m (*Smith*) (BMNH, CNC, USNM). **Surinam**: 1 ♀, Republiek, 25.ii.1966 (*Vreden*) (RNHL). **Trinidad**: allotype ♂, St George, St Augustine, viii.1976 (BMNH); 1 ♂, Comuto, Arepo (*Thaxter*) (MCZ); 2 ♀, Curepe, 31.xi. and 17.xii.1978 (CNC); 2 ♀, St George, St Augustine, viii.1976 (BMNH). **Venezuela**: Bolivar: 1 ♀, Akuriman, x.1940 (*Anduze*) (CU); Miranda: 1 ♀, Caracas to El Sombrero, 9.–12.ix.1927 (*Holt*) (USNM); Monagas: 1 ♀, Centro de Abejas, La Guna Grande St. Pk., 15.–20.xi.1980 (*Kukuk*) (SC).

Alabagrus kagaba sp. n.

(Fig. 20d, Map 22)

Holotype ♀. *Colour*. Black and orange; orange as follows: palpi distally, fore tarsus, propodeum, metapleuron in dorsal third, hind coxa and femur, metasoma except distal fifth; fore wing yellowish hyaline in basal third and in large area around stigma, otherwise infuscate (Fig. 20d).

Head. Antenna with 48 flagellomeres; gena acute posteroventrally (cf. Fig. 2e). *Mesosoma*. Notauli deeply impressed (cf. Fig. 9b); median longitudinal ridge of scutum very weak (cf. Fig. 9b); scutellar furrow smooth, lacking longitudinal carinae (cf. Fig. 8a); apex of scutellum with weak transverse ridge (cf. Fig. 7c); sternaulus short, represented by 2 large foveae posteroventrally (cf. Fig. 5f); border between metepisternum and metepimeron crenulate (cf. Fig. 5d); metapleuron mostly smooth with large crenulae along ventral margin (cf. Fig. 4e); propodeum very wide (cf. Fig. 7a), mostly smooth with posterior median areola and posterior transverse carinae weakly indicated (cf. Fig. 9c); mid tibia with 8 preapical spines; hind tibia with 12 apical spines; hind femur smooth ventrally (cf. Fig. 3e), 3·1 × longer than wide. *Metasoma*. 1st tergum with weak bump medially (cf. Fig. 14a); 1st tergum 0·9 × as long as wide; 2nd plus 3rd tergum 0·9 × as long as wide; both 2nd and 3rd terga with transverse depression (cf. Fig. 13b); ovipositor 0·8 × body length, 3·5 × length of hind femur.

Length. 9·6 mm.

Allotype ♂. As in holotype except: pronotum orange-black; propodeum with slightly more sculpture, anterior median areola indicated; anteromedial bump of 1st metasomal tergum larger; length 9·8 mm.

Variation ♀ ♂. Antennal flagellomeres orange-brown to black; palpi yellow to brown; areas that are orange in the holotype are from orange to reddish brown; hind trochanter can be pale and concolorous with femur and coxa or hind trochanter contrastingly dark; posterior transverse ridge of scutellum weak to absent (cf. Figs 7d, 8a); propodeum with more sculpture (cf. Fig. 6e); mid tibia with 5–10 preapical spines; hind tibia with 8–15 apical spines; length 9·8–10·8 mm; in the sole ♂ available besides the allotype the anterior median areola of the propodeum is well defined.

Distribution and Material examined. Map 22. Vera Cruz, Mexico south through Central America and the Caribbean countries of South America.

Holotype ♀, **Colombia**: Magdalena Valley, El Banco (*Allen*) (BMNH).

Paratypes. **Brazil**: Minas Gerais: 1 ♀, Lassance, 9.–19.xi.1919 (*Harris*) (Lot 569, CU) [validity of the locality data of this specimen questionable]. **Colombia**: allotype ♂, same data as holotype. **Honduras**: 1 ♀, La Paz, 23.vi.1979 (*Chemsak, Michelbacher & Middlekauff*) (UCB). **Costa Rica**: 2 ♀, Guanacaste, Santa Rosa Park, 7. and 23.vii.1977 (*Janzen*) (AEI); 1 ♀, Canas, 1.–15.xi.1976 (*Haber*) (AEI). **Mexico**: Veracruz: 1 ♀, Cotaxtia, Exp. Stat., 12.vii.1962 (*Janzen*) (UCB). **Venezuela**: Monagas, 1 ♂, Jusepin, 18.x.1965 (*Fernandez & Rosales*) (UCV).

Alabagrus kiska sp. n.

(Figs 1b, 5d, 10a, 20b, 20c, Map 4)

Holotype ♀. *Colour*. Yellowish brown except as follows: head brown to black except antenna; fore wing lightly infuscate, with darker parastigmal spot and stigmal area yellow (cf. Fig. 20b).

Head. Antenna with 50 flagellomeres; gena rounded posteroventrally (cf. Fig. 12b); occiput deeply excavated medially; inner angle of occipital excavation sharp (cf. Fig. 1b). *Mesosoma.* Notauli weakly impressed (cf. Fig. 5d); scutum lacking median longitudinal ridge (cf. Fig. 8c); scutellar furrow smooth, lacking longitudinal carinae (cf. Fig. 8a); apex of scutellum smooth, lacking transverse ridge (cf. Fig. 8a); sternaulus composed of one weak fovea posteroventrally and weak smooth groove 0·3 × length of mesopleuron (cf. Fig. 5d); border between metepimeron and metepisternum mostly smooth with several weak crenulae or short ridges (cf. Fig. 5d); metapleuron smooth (cf. Fig. 5d); carina between propodeum and metapleuron weak, smooth; propodeum smooth (cf. Fig. 10a); fore tibia lacking preapical spines along outer surface; mid tibia lacking preapical spines along outer surface; hind tibia with 4 apical spines; hind femur smooth ventrally (cf. Fig. 3e), 3·5 × longer than wide. *Metasoma.* 1st tergum smooth, convex (cf. Fig. 14b); 1st tergum 1·7 × longer than wide; 2nd plus 3rd tergum 1·7 × longer than wide; 2nd tergum with transverse depression (cf. Fig. 14d); 3rd tergum lacking transverse depression (cf. Fig. 14d); ovipositor about 1·1 × body length, 6·6 × length of hind femur.

Length. 11·0 mm.

Allotype ♂. As the holotype except as follows: antenna with 54 flagellomeres, propodeum with several weak carinae medially (weaker than in Fig. 7b); hind femur 4 × wider than long; body length 9·1 mm.

Variation ♀ ♂. This species varies considerably more than most members of the genus. Colour varies from pale as in the holotype to melanic as follows: black, except antennal flagellomeres orange, palpi, tegula, fore leg and mid leg all yellow and metasoma reddish orange; fore wing pattern of 3 basic types as follows: lightly infuscate with brown parastigmal spot and yellow stigmal area (cf. Fig. 20b), deeply infuscate with yellow stigmal area (cf. Fig. 17e), infuscate with basal area and stigmal area yellow (Fig. 20c); intermediates of these three patterns also exist; flagellomere number varies between 50 and 60; fore and mid tibiae with 0–8 preapical spines; propodeum with weak carina in all male and 20% of female specimens, remainder (80% of females) with smooth propodea; 1*RS* cell of fore wing varies from triangular (80%) to subquadrate; metasomal terga can be wider than in the type; 1st tergum as little as 1·3 × longer than wide; hind femur 3·4–4·1 × longer than wide; ovipositor 0·8–1·3 × body length (this character usually varies little in most other species of *Alabagrus*). Length 6·5–12·5 mm.

Remarks. This species is unique in that most specimens (80%) have preapical spines on the fore tibia.

Distribution and Material examined. Map 4. Brazilian Highlands and north-eastern Argentina.

Holotype ♀, **Brazil**: Santa Catarina, Nova Teutonia, 27°11′S, 52°23′W (*Plaumann*) (BMNH).

Paratypes. **Argentina**: Misiones, 2 ♀, Catarates del Iguazu, 5.–9.ix.1970 (*Porter & Stange*) (IML). **Brazil**: allotype ♂, Santa Catarina, Nova Teutonia, 27°11′S, 52°23′W, 27.xii.1938 (*Plaumann*) (BMNH); Minas Gerais: 1 ♀, Pedra Azul, xi.1972 (*Alvarenga*) (CNC); Parana: 2 ♀, Campina Grande, nr Cutiba, 15. and 19.ii.1966 (*Townes*) (AEI); 1 ♀, Foz do Iguacu, 19.vii.1961 (*Krauss*) (USNM); Santa Catarina: 87 ♀, 14 ♂, Nova Teutonia, 27°11′S, 52°23′W (BMNH, CNC, SC).

Alabagrus laevis (Enderlein) **comb. n.**

(Map 4)

Craspedobothrus laevis Enderlein, 1920: 206–207. Holotype ♂, Brazil (MZP) [examined].

Holotype ♂. *Colour.* Yellowish orange, black and light brown, black as follows: head except mouthparts, propleuron and most of propodeum, mid and hind coxa, tibia and tarsus, hind femur in apical fifth, metasoma distal to tergum 3; pale brown as follows: fore and mid femora and mid tibia, remainder of insect yellowish orange including most of mesosoma and metasoma; fore wing with two wide pale bands, stigma yellow (cf. Fig. 18d).

Head. Antenna with ? flagellomeres (antennae broken); gena rounded posteroventrally (cf. Fig. 2f). *Mesosoma.* Notauli weakly impressed (cf. Fig. 8c); scutum lacking median longitudinal ridge; scutellar furrow lacking carinae, smooth; apex of scutellum (posterior) smooth, lacking transverse ridge (cf. Fig. 8a); sternaulus weakly indicated as groove posteroventrally (cf. Fig. 5d); border between metepisternum and metepimeron smooth, lacking crenulae; metapleuron smooth (cf. Fig. 4f); propodeum smooth (cf. Fig. 10c); mid tibia with 2 preapical spines; hind tibia with 4 apical spines; hind femur smooth ventrally, 3·8 × longer than wide. *Metasoma.* 1st tergum with strong bump anteromedially (cf. Fig. 14a but larger); 1st tergum 1·4 × longer than wide; 2nd tergum with transverse depression; 3rd tergum lacking transverse depression (cf. Fig. 12d); 2nd plus 3rd tergum 1·2 × longer than wide.

Length. 10·0 mm.

DISTRIBUTION AND MATERIAL EXAMINED. Map 4. Known only from the type locality, Para, Brazil.
Holotype ♂, *Craspedobothrus laevis* Enderlein, **Brazil**: Para, Obidos, iv.–v.1906 (*Hoffmans*) (MZP).

Alabagrus latisoma sp. n.

(Figs 3e, 7a, 13b, Map 7)

HOLOTYPE ♀. *Colour.* Black except: palpi yellow, fore tarsus entirely and middle tarsus partially yellow; medial portion of fore coxa and mid coxa and mesopleuron ventrally, all reddish black; hind coxa, trochanter, femur and tibia basally all red; metapleuron, propodeum, and first 3 metasomal segments all red; fore wing infuscate (cf. Fig. 16).

Head. Antenna with 40 flagellomeres; gena acute posteroventrally (cf. Fig. 2e). *Mesosoma.* Notauli well impressed (Fig. 7a); scutum lacking median longitudinal ridge (Fig. 7a); scutellar furrow with median longitudinal carina (Fig. 7a); apex of scutellum with transverse rugose ridge (Fig. 7a); sternaulus weak, represented by 2 large foveae posteroventrally (cf. Fig. 5f); border between metepisternum and metepimeron crenulate (cf. Fig. 5d); metapleuron mostly smooth with large foveae on all margins (cf. Fig. 5c); propodeum wide, areolate (Fig. 7a); mid tibia with about 6 preapical spines; hind tibia with about 25 apical spines; hind femur smooth ventrally (cf. Fig. 3e), 3·1 × longer than wide. *Metasoma.* 1st tergum with strong, long, median longitudinal carina (Fig. 13b); 1st tergum 1·1 × wider than long; 2nd plus 3rd tergum 1·1 × wider than long; 2nd tergum with deep transverse depression; 3rd tergum with shallow transverse depression (Fig. 13b); ovipositor 0·6 × body length, 2·6 × length of hind femur.

Length. 8·0 mm.

ALLOTYPE ♂. As in holotype ♀ except: mesosoma lighter in coloration ventrally; metapleuron almost completely rugose; metasomal terga wider; length 7·7 mm.

VARIATION ♀ ♂. Colour varies slightly, mesosoma entirely black ventrally, metasoma entirely red, mid tarsus black; fore wing from mostly infuscate to yellowish infuscate in basal two-thirds and infuscate distally (cf. Fig. 19a); weak longitudinal ridge present on scutum, anteriorly (cf. Fig. 9b); metapleuron variable in sculpture, from mostly smooth with areolae restricted to margins (cf. Fig. 5c) to entirely areolate (cf. Fig. 4c); length 6·8–9·9 mm.

DISTRIBUTION AND MATERIAL EXAMINED. Map 7. Widespread from southern Panama to northern Argentina and east to Para, apparently absent from the Brazilian Highlands.
Holotype ♀, **Argentina**: Jujuy, Yuto, 11.i.1966 (*Townes*) (AEI).
Paratypes. **Argentina**: allotype ♂, same data as holotype except 10.i.1966; Entre Rios: 1 ♀ Pronunciamiento, xii.1963 (CNC); Juyuy: 5 ♀, same data as holotype; Salta: 1 ♀, Oran, Abra Crande, 18.iv.–5.v.1969 (*Porter*) (MCZ). **Brazil**: Para: 1 ♀, Rio Acara, 1930 (*Horvath*) (TMB). **Colombia**: Valle del Cauca: 2 ♀, Buenaventura, iv.1965 (*Michelbacher*) (UBC). **Ecuador**: Esmeraldas: 1 ♀, San Lorenzo, 5 m, 3.–10.vi.1975 (*Peck*) (AEI); Guayas: 1 ♀, Guayaquil, 1930 (USNM). **Guyana**: 1 ♀, 1908 (*Rodway*) (BMNH). **Panama**: 1 ♀, Canal Zone, Barro Colorado, 19.vii.1923 (*Shannon*) (USNM). **Peru**: Pasco: 1 ♀, Puerto Bermudez, Rio Pichis, 18.–19.vii.1920 (CU). **Surinam**: 1 ♂, Clevia, Paramaribo, 1.v.1963 (*Van Doesburg*) (RNHL); 1 ♀, Paramaribo, 14.–16.i.1964 (*Geijskes*) (RNHL); 2 ♀, Saint Barbara Pln., Suriname River, 15.iv.1927 (CU). **Trinidad**: 1 ♀, Centeno, 22.i.1960 (CNC); 3 ♀, Curepe, xi. and xii.1977 (*Mason*) (MC); 1 ♀, Curepe, 10.i.1979 (CNC); 1 ♂, Curepe, viii.1978 (CNC); 10 ♀, 5 ♂, Curepe, viii., x. and xi.1976 (*Bennett*) (BMNH); 1 ♀, Maracas Valley, xi.1977 (*Bennett*) (BMNH); 3 ♀, 3 ♂. Saint Augustine, viii.1976 (BMNH); 1 ♀, Saint Augustine, 15.vi.–13.viii.1976 (*Noyes*) (BMNH); 1 ♀, Saint Augustine, 19.vi.1961 (*Gopaul*) (CNC); 1 ♀, Saint Augustine, 2.i.1953 (*Simmonds*) (CNC); 1 ♀, Saint Augustine, 2.i.1953 (*Simmonds*) (CNC); 1 ♀, Saugre-Grande, x.1959 (CNC); 1 ♀, 1 ♂, Spring Hill, Arima, 370 m, 10.xii.1952 (*Simmonds*) (CIBC); 1 ♂, 25.xi.1928 (*Myers*) (BMNH).

Alabagrus latreillei (Spinola) comb. n.

(Figs 2a, 20a, Map 7)

Agathis latreillei Spinola, 1840: 191–192. Holotype ♀, FRENCH GUIANA (MIZT) [examined].
Agathis lepida Brullé, 1846: 497. Holotype ♀, CENTRAL AMERICA (MNHP) [examined].
Craspedobothrus fuscovittatus Enderlein, 1920: 206. Holotype ♀, SURINAM (MZP) [examined].

HOLOTYPE ♀. *Colour.* Black and orange; black as follows: head except palpi, body of mesosoma except propodeum, hind coxa laterally, hind tarsus; fore wing with distinct bands coloured from base as follows: yellow, infuscate, yellow, infuscate (Fig. 20a).

Head. Antenna with 51 to 54 flagellomeres (antenna broken on type); gena acute posteroventrally (Fig. 2a). *Mesosoma.* Notauli well impressed (cf. Fig. 9b); scutum with weak median longitudinal ridge (cf. Fig. 9b); scutellar furrow smooth, lacking longitudinal carinae (cf. Fig. 8a); apex of scutellum with weak, rounded transverse ridge (cf. Fig. 7d); sternaulus 0·5 × length of mesopleuron (cf. Fig. 5c), composed of large foveae; border between metepisternum and metepimeron crenulate (cf. Fig. 5d); metapleuron mostly smooth with large areolae on ventral and posterior margins (cf. Fig. 5e); propodeum smooth (cf. Fig. 10c); mid tibia with 3 preapical spines; hind tibia with 4–5 apical spines; hind femur smooth ventrally (cf. Fig. 3e), 4·4 × longer than wide. *Metasoma.* 1st tergum with long smooth median ridge (cf. Fig. 13a); 1st tergum 1·1 × longer than wide; 2nd plus 3rd tergum 1·3 × longer than wide; 2nd tergum with distinct transverse depression (cf. Fig. 14d); 3rd tergum lacking transverse depression (cf. Fig. 14d); ovipositor 1·0 × body length, 3·5 × length of hind femur.

Length. 10·0 mm.

MALE. Essentially as in female.

VARIATION ♂ ♀. Laterotergites of metasoma can be yellow, paler than median tergites; scutum can have some pale colour peripherally; orange colour of holotype can be yellow; hind coxa and metapleuron vary from yellow to black; metasoma can have some black mottling dorsally; one male specimen has some weak sculpture on propodeum anteriorly; median carinae on metasomal tergum 1 sometimes much reduced; 1st tergum 1·0–1·2 × longer than wide; ovipositor 0·9–1·0 × body length.

DISTRIBUTION AND MATERIAL EXAMINED. Map 7. Widespread though rare from the Canal Zone of Panama east to Surinam and through the Amazon Basin south to Brazilia and southern Bahia.

Holotype ♀, *Agathis latreillei*, **French Guiana**: Cayenne, 1839 (*Lepriene*) (MIZI). Holotype ♀, *Agathis lepida*, 'l'Amérique méridionale' (MNHP). Holotype ♀, *Craspedobothrus fuscovittatus*, **Surinam**: v.–ix., (*Fruhstorfer*) (MZP).

Specimens that I have determined are deposited in the following institutions: AEI, CNC, RNHL.

Alabagrus leptosoma sp. n.

(Map 12)

HOLOTYPE ♀. *Colour.* Black except: palpi yellow, fore and mid tarsi yellow; fore and mid tibia partly yellow; hind trochanter, femur and tibia brownish orange; anterior two-thirds of metasoma orange; fore wing with distinct bands coloured from base as follows: yellow, infuscate, yellow, infuscate (cf. Fig. 18d).

Head. Antenna with ? flagellomeres (antennae broken); gena acute posteroventrally (cf. Fig. 2e). *Mesosoma.* Notauli well impressed (cf. Fig. 9b); scutum with weak median longitudinal ridge (cf. Fig. 9b); scutellar furrow smooth, lacking longitudinal carinae (cf. Fig. 8a); apex of scutellum smooth, lacking ridge and rugae (cf. Fig. 8a); sternaulus well impressed, with large foveae, 0·5 × length of mesopleuron (cf. Fig. 5c); border between metepisternum and metepimeron crenulate (cf. Fig. 5d); metapleuron smooth except for large crenulae ventrally (cf. Fig. 5c); propodeum smooth (cf. Fig. 10c); mid tibia with 3 preapical spines; hind tibia with 7 apical spines; hind femur smooth ventrally (cf. Fig. 3e), 4·2 × longer than wide. *Metasoma.* 1st tergum with long, smooth, median, longitudinal carina (cf. Fig. 13a); 1st tergum 2·0 × longer than wide; 2nd plus 3rd tergum 2·0 × longer than wide; both terga 2 and 3 with transverse depression (cf. Fig. 13b); ovipositor 0·8 × body length, 3·7 × longer than hind femur.

Length. 11·5 mm.

VARIATION ♀. Sole paratype essentially as in holotype.

DISTRIBUTION AND MATERIAL EXAMINED. Map 12. Surinam.

Holotype ♀, **Surinam**: Sipaliwini, 12.vi.1963 (*Van Doesburg*) (RNHL).

Paratype. **Surinam**: 1 ♀, Republiek, 21.iii.1965 (*Broekhuizen*) (RNHL) [head missing].

Alabagrus levipodeum sp. n.

(Map 7)

HOLOTYPE ♀. *Colour.* Orange except black as follows: head except palpi, propleuron, pronotum, all coxae, fore and mid trochanters, fore, mid and most of hind femur, hind tarsus and metasoma terminally; fore wing yellow basally with sharply defined infuscate band in distal quarter (cf. Fig. 19d).

Head. Antenna with ? flagellomeres (antennae broken after segment 40), gena acute posteroventrally (cf. Fig. 2e). *Mesosoma.* Notauli deeply impressed (cf. Fig. 7d), scutum with well-defined, median, longitudinal ridge (cf. Fig. 7d); scutellar furrow smooth, lacking longitudinal carinae (cf. Fig. 8a); apex of

scutellum with sharply defined transverse ridge but lacking rugae (cf. Fig. 8d); sternaulus foveolate, 0·5 × length of mesopleuron (cf. Fig. 5c); metapleuron smooth except for several weak crenulae along metepisternal metepimeral border (cf. Fig. 5d); propodeum smooth (cf. Fig. 10c); carinae between propodeum and metapleuron absent anteriorly; mid tibia with 1 preapical spine; hind tibia with 3 apical spines; hind femur smooth ventrally (cf. Fig. 3e), 4·8 × longer than wide. *Metasoma.* 1st tergum convex (cf. Fig. 14a), 1·8 × longer than wide; 2nd plus 3rd terga 1·9 × longer than wide; 2nd and 3rd terga lacking transverse depression (cf. Fig. 15a); ovipositor 0·9 × body length, 3·1 × length of hind femur.

Length. 8·5 mm.

ALLOTYPE ♂. As in holotype ♀ except metapleuron partly melanic, hind femur 4·5 × longer than wide.

DISTRIBUTION AND MATERIAL EXAMINED. Map 7. Huanuco, Peru.

Holotype ♀, **Peru**: Huanuco, Tingo Maria, 620 m, 20.–27.i.1968 (*Garcia & Porter*) (MCZ).

Allotype ♂, **Peru**: Huanuco, Yanayacu, Rio Pachitea, 14.vii.1961 (*Schunke*) (BMNH).

Alabagrus llampu sp. n.

(Map 12)

HOLOTYPE ♀. *Colour.* Reddish orange and black with some yellow; fore tarsus yellow; apical flagellomeres pale yellow; black as follows: head including palpi and basal flagellomeres, mesosoma ventrally, fore leg excluding tarsus, mid leg, trochanter of hind leg and metanotum; remainder of body reddish orange; fore wing infuscate with stigmal area yellow (cf. Fig. 17e).

Head. Antenna with 49 flagellomeres, gena rounded posteroventrally (cf. Fig. 2b). *Mesosoma.* Notauli very weak (cf. Fig. 8c); scutum lacking median longitudinal ridge (cf. Fig. 8c); scutellar furrow mostly smooth, 1 median carina weakly indicated posteriorly (cf. Fig. 7c); apex of scutellum smooth, lacking transverse ridge (cf. Fig. 8a); sternaulus well impressed with foveae extending 0·5 × length of mesopleuron (cf. Fig. 5c, but with more and smaller foveae); border between metepisternum and metepimeron crenulate (cf. Fig. 5d); metapleuron smooth except for crenulae on margins (cf. Fig. 4e); propodeum with weak longitudinal carina and slightly rugose medially (cf. Fig. 7b, but weaker); mid tibia with 3 preapical spines, hind tibia with 8 apical spines; hind femur smooth with large punctures ventrally (cf. Fig. 3b); 3·5 × longer than wide. *Metasoma.* 1st tergum convex (cf. Fig. 14b), 1·5 × longer than wide; 2nd plus 3rd tergum 1·5 × longer than wide; 2nd tergum with transverse depression (cf. Fig. 14d), area posterad depression higher than anterior section (cf. Fig. 12d); 3rd tergum lacking transverse depression (cf. Fig. 14d); ovipositor 0·9 × body length, 3·2 × length of hind femur.

Length. 6·8 mm.

DISTRIBUTION AND MATERIAL EXAMINED. Map 12. Known only from the type locality in Santa Caterina, Brazil.

Holotype ♀, **Brazil**: Santa Catarina, Nova Teutonia, 27°11′S, 52°23′W, 300–500 m, ix.1966 (*Plaumann*) (CNC).

Alabagrus lokono sp. n.

(Map 3)

HOLOTYPE ♀. *Colour.* Black, orange and yellow; black as follows: head except palpi, body of mesosoma, hind coxa posteriorly, patches on metasomal terga, and metasoma in distal fifth; yellow as follows: palpi, all legs except part of hind coxa, hind tarsus except darkening distally, and tegula; most of metasoma orange; fore wing banded from base as follows: yellow, infuscate, yellow, infuscate (cf. Fig. 19d).

Head. Antenna with 43 flagellomeres; gena acute posteroventrally (cf. Fig. 2e). *Mesosoma.* Notauli deeply impressed (cf. Fig. 7d); median longitudinal ridge of scutum present (cf. Fig. 7d); scutellar furrow smooth, lacking longitudinal carinae (cf. Fig. 8a); apex of scutellum with weak, smooth, transverse ridge (cf. Fig. 7d); sternaulus weak, foveolate, 0·3 × length of mesopleuron (cf. Fig. 5e); metapleuron smooth (cf. Fig. 5d) except for several weak crenulae between metepisternum and metepimeron (weaker than in Fig. 5e); propodeum smooth (cf. Fig. 10c); carina between metapleuron and propodeum absent except in posterior tenth of border; mid tibia with 2 preapical spines; hind tibia with 3 apical spines; hind femur smooth ventrally (cf. Fig. 3e), 4·8 × longer than wide. *Metasoma.* 1st tergum convex, without distinct bump (cf. Fig. 14b); 1st tergum 1·6 × longer than wide; 2nd plus 3rd tergum 1·6 × longer than wide; 2nd tergum with transverse depression (cf. Fig. 14d); 3rd tergum lacking transverse depression; ovipositor 0·6 × body length, 2·1 × longer than hind femur.

Length. 8·0 mm.

VARIATION ♀. Lateral lobes of scutum often orange, rarely entire scutum orange; metasoma with black coloration restricted to distal fifth; sternaulus often longer, 0·5 × length of mesopleuron (cf. Fig. 5c); posterior transverse ridge of scutellum can be weaker; suture between metepimeron and metepisternum sometimes smooth (cf. Fig. 4f).

DISTRIBUTION AND MATERIAL EXAMINED. Map 3. Widespread but rare in Mato Grosso, the eastern foothills of the Andes and the Guyanas.

Holotype ♀. **Surinam**: Republiek, 5.ii.1963 (*Geijskes*) (AEI).

Paratypes. **Brazil**: Mato Grosso: 2 ♀, Sinop, x.1974 (*Alvarenga*) (CNC). **Guyana**: 1 ♀, Mazaruni, 2nd growth low forest, 23.viii.1937 (*Richards & Smart*) (BMNH). **Peru**: Loreto: 2 ♀, Pucallpa, 20. and 23.xi.1962 (*Schunke*) (BMNH).

Alabagrus maculipes (Cameron) **comb. n.**

(Fig. 17c, Map 21)

Microdus maculipes Cameron, 1887: 404. Holotype ♂, GUATEMALA (BMNH) [examined].
Microdus trochanteratus Cameron, 1905: 50. Holotype ♀, NICARAGUA (BMNH) [examined].

HOLOTYPE ♂. *Colour.* Yellowish orange except the following areas brown to black: antenna, mid tibia in distal fifth, hind trochanter, hind tibia in distal fifth; fore wing infuscate with yellowish hue present in basal half (Fig. 17c).

Head. Antenna with 33 to 38 flagellomeres (antennae broken on type, number based on conspecific specimens); gena rounded posteroventrally (cf. Fig. 2b). *Mesosoma.* Notauli deeply impressed (cf. Fig. 7d); median longitudinal ridge of scutum present (cf. Fig. 7d); scutellar furrow with median longitudinal carina (cf. Fig. 7d); apex of scutellum smooth with weak transverse ridge (cf. Fig. 7d); sternaulus rather weak, consisting of several deep foveae posteroventrally and smooth groove 0·5 × length of mesopleuron (similar to Fig. 14f but smoother); border between metepisternum and metepimeron crenulate (cf. Fig. 5d); metapleuron mostly smooth, margined by crenulae (cf. Fig. 4e); propodeum areolate, all crenulae present (cf. Fig. 7b); mid tibia with 3 preapical spines (cf. Fig. 3d); hind tibia with 5 apical spines; hind femur smooth ventrally (cf. Fig. 3e), 3·4 × longer than wide. *Metasoma.* 1st tergum with small longitudinal bump anteromedially (cf. Fig. 14a); 1st tergum 1·3 × longer than wide; 2nd plus 3rd tergum 1·2 × longer than wide; 2nd tergum with weak transverse depression (cf. Fig. 14b); 3rd tergum lacking transverse depression (cf. Fig. 14d).

Length. 5·7 mm.

FEMALE. As in male except as follows: ovipositor 0·7 × body length, 2·4 × length of hind femur; fore wing usually pale yellow basally with distinct infuscate band terminally (cf. Fig. 9a); propodeal sculpture sometimes weaker than male, i.e. anterior transverse carinae weak and absent laterally (cf. Fig. 9a).

VARIATION ♀ ♂. Head orange (90%) to black (5%); mid and hind trochanters orange to black; fore and mid femur sometimes melanic in distal half; fore and mid tibia sometimes partly melanic; fore wing from completely infuscate (cf. Fig. 16) to yellowish hyaline basally and infuscate in distal third (cf. Fig. 19a); antenna with 33–38 flagellomeres; posterior transverse ridge of scutellum present or absent (cf. Figs 8a and 7d), if present then smooth or at most with several weak rugae (cf. Fig. 7c); anterior transverse carina of propodeum present or absent (cf. Figs 9b and 7d); ovipositor 0·7–0·8 × body length, 2·3–2·6 × length of hind femur; body length 4·4–6·9 mm.

REMARKS. The holotype of *A. trochanteratus* (Cameron) is very similar to that of *A. maculipes* except for some darker coloration on the fore and hind legs of the former.

Some populations of *A. maculipes* show sexual dimorphism in wing pattern; for example, in Trinidad all males have the fore wing evenly infuscate and all females have a clear wing with an infuscate distal band (cf. Fig. 19a). In other populations this pattern does not seem to hold; in fact elsewhere, rarely, there are males with infuscate distal bands.

DISTRIBUTION AND MATERIAL EXAMINED. Map 21. From the mid latitudes of Mexico south through Central America, Cuba to the Caribbean countries of South America.

Holotype ♂, *Microdus maculipes* Cameron, **Guatemala**: San Geromino, (*Champion*) (BMNH). Holotype ♀, *Microdus trochanteratus* Cameron, **Nicaragua**: San Marcos, (*Baker*) (BMNH).

Specimens that I have identified are deposited in the following institutions: AEI, AMNH, ANSP, BMNH, CIBC, CNC, CU, FSCA, IML, LFAZ, NHMV, RNHL, SMEK, SC, TAMU, USNM, UCB, UCV, UGA.

Alabagrus marginatifrons (Muesebeck) comb. n.

(Map 16)

Bassus marginatifrons Muesebeck, 1927: 30–31. Holotype ♀, U.S.A. (USNM) [examined].

Holotype ♀. *Colour.* Yellowish brown except head brownish black; hind trochanter, tarsus and hind tibia distally all brown; fore wing infuscate (cf. Fig. 16).

Head. Antenna with 49 flagellomeres; gena rounded posteroventrally (cf. Fig. 2b). *Mesosoma.* Notauli well impressed (cf. Fig. 7b); scutum with median longitudinal ridge (cf. Fig. 7d); scutellar furrow with median longitudinal carina (cf. Fig. 7d); apex of scutellum with acute transverse ridge (cf. Fig. 8d); sternaulus well impressed, foveolate, 0·7 × length of mesopleuron (cf. Fig. 4c); metapleuron smooth dorsally, rugose in ventral third (cf. Fig. 6a); anterior areolae of propodeum weak, long, narrow, anterior transverse carina absent; posterior areola weak (cf. Fig. 9d); mid tibia with 6 preapical spines; hind tibia with 8 apical spines; hind femur smooth ventrally, 4·8 × longer than wide. *Metasoma.* 1st tergum convex (cf. Fig. 14b); 1st tergum 1·7 × longer than wide; 2nd plus 3rd tergum 1·6 × longer than wide; 2nd tergum with weak transverse depression (cf. Fig. 14d); 3rd tergum lacking transverse depression (cf. Fig. 14d); ovipositor 1·3 × body length, 4·5 × length of hind femur.

Length. 9·2 mm.

Male. As in holotype ♀ except as follows: propleuron, pronotum ventrally and mesopleuron below sternaulus can be brown or brownish yellow; propodeum areolate, anterior transverse carinae weak, irregular (cf. Fig. 5f, but slightly stronger sculpture); in general all sculptural features stronger than in females; metapleuron rugose in ventral two-fifths; 1st metasomal tergum with median carina (cf. Fig. 13d) and rarely with rugae laterally (cf. Fig. 12c).

Variation ♀. Face and clypeus with patches of pale colour; metapleuron from almost completely smooth except for crenulae peripherally to rugose in ventral two-fifths (cf. Figs 4a and 4e); propodeum smooth to areolate with anterior transverse carina always lacking (cf. Fig. 9b); hind femur 4·7–5·1 × longer than wide; body length 8·2–9·2 mm.

Distribution and Material examined. Map 16. Widespread, though rare, in central and south-eastern U.S.A., and widespread and more common in western and southern Mexico.

Holotype ♀, **U.S.A.**: Alabama, Clay Co., Pyziton (*Smith*) (USNM type no. 28679).

Specimens that I have determined are deposited in the following institutions: ANSP, CNC, MCZ, TAM, UCB, USNM.

Alabagrus masneri sp. n.

(Figs 4e, 7c, Map 13)

Holotype ♀. *Colour.* Yellowish orange except some black and brown; head black; brown as follows; fore and mid legs except tarsi; hind trochanter, tarsus and most of tibia; fore wing infuscate (cf. Fig. 16).

Head. Antenna with 36 flagellomeres; margins of frons reduced, incomplete (cf. Fig. 1d); gena rounded posteroventrally (cf. Fig. 2b). *Mesosoma.* Notauli well impressed (Fig. 7c); scutum lacking median longitudinal ridge (Fig. 7c); scutellar furrow smooth; lacking longitudinal carinae (cf. Fig. 8a); apex of scutellum, with weak transverse ridge (Fig. 7c); sternaulus represented by several foveae posteroventrally (cf. Fig. 4e); metapleuron smooth except for crenulae between metepimeron and metepisternum and weak crenulae on margins (cf. Fig. 4e); propodeum mostly smooth with several longitudinal rugae (Fig. 7c); mid tibiae with 3 preapical spines; hind tibia with 3 apical spines; hind femur smooth ventrally, 3·9 × longer than wide. *Metasoma.* 1st tergum with bump and short longitudinal ridge anteromedially (cf. Fig. 14a); 1st tergum 1·7 × longer than wide; 2nd plus 3rd tergum 1·4 × longer than wide; neither 2nd nor 3rd terga with distinct transverse depression (cf. Fig. 15a); ovipositor 1·1 × body length, 3·8 × length of hind femur.

Length. 5·1 mm.

Allotype ♂. As in ♀ holotype except as follows: antenna with 34 flagellomeres; propodeum areolate, all major propodeal carina present (cf. Fig. 7d); 1st metasomal tergum with median longitudinal carina (cf. Fig. 13d); length 4·7 mm.

Variation ♀ ♂. Fore and mid legs always with some brown but with varying amounts of yellow; head and antenna from reddish brown to black; rarely, in some males, all legs brown; metasoma mostly brown; propodeum, metapleuron and anterior portion of metasoma cream-coloured; some specimens from Central America with propleuron black; scutellar furrow with weak median carina sometimes indicated (Fig. 7c); posterior ridge of scutellum variable, weakly rugose to completely absent (cf. Figs 7b and 8a);

male propodea always areolate; female propodea with very reduced sculpture (cf. Figs 10a, c, e) or completely smooth; ovipositor 1·1–1·3 × body length; body length 3·8–6·0 mm.

DISTRIBUTION AND MATERIAL EXAMINED. Map 13. Widespread from Belize south to Peru and east to Surinam.

Holotype ♀, **Panama**: Canal Zone, Margarita, iii.1960 (*Breeland*) AEI).

Paratypes. **Belize**: 3 ♀, Middlesex, 125 m, 18.iii.–25.iv.1965 (*Welling*) (CNC); 1 ♀, Melinda For. Sta. nr Stann Creek, 8.vii.1963 (*Porter*) (MCZ). **Costa Rica**: 4 ♀, La Fortuna, 18.ii.1964 (*Evans*) (MCZ); 1 ♀, La Lola, 1.v.1957 (*Shenefelt*) (SC); 2 ♀, 4 ♂, Pto. Viejo, 50 m, rain forest, ii.1980 (*Mason*) (MC); 3 ♀, 2 ♂, Tolido Dist., Blue Creek, 89°3′W 16°12′N, 23.i.1982 (*Finnamore*) (CNC). **Colombia**: Narino: 1 ♂, Llorente, Carretera, Pastol, Tumaco, 25.xi.1977 (*Tidwell*) (FSCA); Valle de Cauca: 1 ♀, Anchicaya, 15.xii.1977 (*Tidwell*) (FSCA); 4 ♂, 30 km E. Buenaventura, tropical very wet forest, 560 m, 13.–18.viii.1975 (*Wilkerson*) (FSCA); 1 ♂, Rio Zabaletas, 3.–5.vi.1975 (*Wilkerson*) (FSCA). **Ecuador**: Esmeraldas: 1 ♂, Cumbaratza, 21.xi.1970 (*Pena*) (AEI); Napo: 1 ♀, Limoncocha, on Rio Napo, 15.vii.1974 (*Drummond*) (FSCA); 2 ♀, same data as preceding except 18.i.1974; 1 ♂, Puerto Misahualli, 350 m, 18.–22.ii.1983 (*Sharkey*) (CNC); 2 ♂, Puerto Misahualli, 20.ii.1983 (*Huggert*) (CNC); 1 ♂, Sacha, 9.iii.1983 (*Huggert*) (CNC); Pichincha: 2 ♀, 1 ♂, Monte Enela, 600 m, 4.ii.83 (*Sharkey*) (CNC); 1 ♀, Rio Palenque Res. Sta. 47 km S. Sto. Domingo, 200 m, 18.–30.v.1975 (*Peck*) (CNC); 4 ♀, same data as preceding except 22.–31.vii.1976; 2 ♀, same data as preceding except 4.ii.1983 (*Sharkey*); 1 ♀, Rio Toachi, 4 km E. Alluriquin, 17.vi.1977 (*Hodges*) (USNM); 2 ♀, Sto. Domingo, 4.–14.vi.1976 (*Peck*) (CNC); 4 ♀, 2 ♂, same data as preceding except 2.–8.ii.1983 (*Masner & Sharkey*); 4 ♀, same data as preceding except vii.1983 (*Sharkey*); 7 ♀, 1 ♂, Tinalandia, 800 m, vii.1983 (*Sharkey*) (CNC). **El Salvidor**: 1 ♀, San Salvidor, 19.v.1958 (*Cartwright*) (USNM). **Guatemala**: 2 ♀, 3 mi. [5 km], Matias de Galvey, 14.viii.1965 (*Spangler*) (USNM). **Panama**: allotype ♀, same data as holotype; 1 ♀, C.Z. (*Fischer*) (MSUE); 1 ♀, C.Z., Las Cumbres, xi.1982 (*Wolda*) (CNC); 1 ♀, C.Z., Summit, xi.1965 (*Krauss*) (USNM); 1 ♀, Ft. Clayton, 11.iv.1923 (USNM); 1 ♀, El Cermeno, i.–iii.1941 (*Zetek*) (USNM); 1 ♀, El Valle, 14.xii.1963 (*Bottimer*) (CNC); 29 ♀, 74 ♂, C.Z., Las Cumbres, xii.1981, i.–iii.v.vi.xi.1982 (*Wolda*) (CNC); 24 ♀, 28 ♂, C.Z., Margarita, i.ii.iv.v.1960 (*Breeland*) (AEI); 1 ♀, Porto Bello, Pan Mar, 14.viii.1911 (*Busck*) (USNM). **Peru**: Huanaco: 1 ♀, Tingo Maria, 17.–22.i.1984 (*Finnamore*) (CNC); Madre de Dios: 2 ♂, Puerto Maldonado, 21.i.1984 (*Huggert*) (CNC); 2 ♂, Tambopata Res., 50 km S. Puerto Maldonado on Rio Tambopata, 3.–8.i.1984 (CNC). **Surinam**: 1 ♀, Sipaliwini, 10.vi.1963 (*Van Doesburg*) (RNHL).

Alabagrus masoni sp. n.

(Fig. 19a, Map 19)

HOLOTYPE ♀. *Colour.* Orange except: head, except palpi, black; hind tarsus and tibia distally brown; fore wing yellow basally infuscate in apical half, margin between yellow and infuscate portions of wing not sharply defined (cf. Fig. 19a).

Head. Antenna with 38 flagellomeres; gena rounded posteroventrally (cf. Fig. 2b). *Mesosoma.* Notauli deeply impressed (cf. Fig. 9b); median longitudinal ridge of scutum weak (cf. Fig. 9b); scutellar furrow with weak medial longitudinal carina (cf. Fig. 7d); apex of scutellum with rugose, transverse ridge (cf. Fig. 7a); sternaulus short, represented by 2 foveae posteroventrally (cf. Fig. 5f); border between metepisternum and metepimeron crenulate (cf. Fig. 5d); metapleuron mostly smooth with crenulae on most margins except posterior (cf. Fig. 4d); propodeum areolate, anterior transverse carina absent laterally (cf. Fig. 9b); mid tibia lacking preapical spines; hind tibia with 3 apical spines; hind femur smooth ventrally (cf. Fig. 3e), 4·0 × longer than wide. *Metasoma.* 1st tergum convex (cf. Fig. 14a); 1st tergum 1·4 × longer than wide; 2nd plus 3rd tergum 1·3 × longer than wide; 2nd tergum with weakly impressed transverse depression (cf. Fig. 14b); 3rd tergum lacking transverse depression (cf. Fig. 14d); ovipositor 0·4 × body length, 1·1 × length of hind femur.

Length. 6·5 mm.

VARIATION. The sole paratype is essentially the same as the holotype.

DISTRIBUTION AND MATERIAL EXAMINED. Map 19. Known only from the type locality, Sinaloa, Mexico.

Holotype ♀, **Mexico**: Sinaloa, 15 km W. El Palmito, 5000′ [1542 m], 30.vii.1964 (*Mason*) (CNC).

Paratype. 1 ♀, same data as holotype.

Alabagrus mataco sp. n.

(Fig. 17a, Map 4)

HOLOTYPE ♀. *Colour.* Yellowish orange and black; black as follows: head except mouthparts, hind leg at points of articulation, hind trochanter and hind tarsus; fore wing infuscate with clear band in distal third fourth (Fig. 17a).

Head. Antenna with 34 flagellomeres; gena right angled posteroventrally (cf. Fig. 2d). *Mesosoma.* Notauli deeply impressed (cf. Fig. 7d), median longitudinal ridge of scutum present (cf. Fig. 7d); scutellar furrow mostly smooth with weak indication of median carina posteriorly (cf. Fig. 7c); apex of scutellum (posterior) with sharply defined transverse ridge (cf. Fig. 8d); sternaulus foveolate, 0·5 × length of mesopleuron (cf. Fig. 5c); border between metepisternum and metepimeron crenulate (cf. Fig. 5d); metapleuron mostly smooth with crenulae along ventral margin; propodeum mostly smooth with anterior areola and anterior transverse carina absent (cf. Fig. 7c); mid tibia with 2 preapical spines; hind tibia with 2 apical spines; hind femur with weak rugae ventrally (slightly rougher than in Fig. 3b); hind femur 4·1 × longer than wide. *Metasoma.* 1st tergum convex (cf. Fig. 14b); 1st tergum 1·7 × longer than wide; 2nd plus 3rd tergum 1·3 × longer than wide; 2nd tergum with very weak transverse depression (cf. Fig. 14b); 3rd tergum without transverse depression (cf. Fig. 14d); ovipositor 0·8 × body length, 3·2 × length of hind femur.

Length. 4·7 mm.

ALLOTYPE ♂. As in female holotype except: antenna with 37 flagellomeres; propodeum completely areolate (cf. Fig. 7d); vertex of head partly black.

VARIATION ♀ ♂. Head yellowish orange to black, legs vary from as light as those of holotype to all completely brownish black; metasoma of some males is cream coloured basally and mottled brown distally; 2nd tergum of metasoma often lacking any trace of transverse depression (cf. Fig. 15a).

DISTRIBUTION AND MATERIAL EXAMINED. Map 4. Peru south to northern Argentina.

Holotype ♀, **Argentina**: Salta, 24 km NW. Aguas Blancas, 9.v.1969 (*Porter*) (MCZ).

Paratypes. **Argentina**: 1 ♀, Salta, nr Aguas Blancas, 1.v.1968 (*Porter*) (MCZ). **Costa Rica**: 1 ♀, Surrubres (TMB) [I question the validity of the locality data of this specimen]. **Peru**: allotype ♂, Cuzco, Avispas, 20. or 30.ix.1962 (SC); Cuzco: 2 ♂, Avispas, ix.1962 (SC); 4 ♂, Quince Mil, ix.1962 and 10.–15.xi.1962 (SC); Huanuco: 2 ♀, Tingo Maria, 20.–27.i.1968 (*Garcia & Porter*) (MCZ).

Alabagrus maue sp. n.

(Map 5)

HOLOTYPE. *Colour.* Black and orange with some yellow; yellow as follows: palpi, most of fore leg except black patch on femur, parts of mid tibia and tarsus; orange as follows: propodeum, hind coxa except for lateral black band, hind femur, part of hind tibia, metasomal segments 1 to 4; fore wing banded from base as follows: yellow, infuscate, yellow, infuscate; median infuscate band incomplete posteriorly.

Head. Antenna with 48 flagellomeres; gena acute posteroventrally (cf. Fig. 2e). *Mesosoma.* Notauli deeply impressed (cf. Fig. 7d); median longitudinal ridge of scutum present (cf. Fig. 7d); scutellar furrow with median longitudinal carinae (cf. Fig. 7b); apex of scutellum with weak, transverse ridge (cf. Fig. 7d); sternaulus short, represented by several foveae posteroventrally, 0·3 × length of mesopleuron (cf. Fig. 5f); border between metepisternum and metepimeron crenulate (cf. Fig. 5d); metapleuron mostly smooth with crenulae along margins (cf. Fig. 5c); propodeum areolate, anterior transverse carina absent (cf. Fig. 9b); mid tibia with 4 preapical spines; hind tibia with 7 apical spines; hind femur smooth ventrally (cf. Fig. 3e), 3·5 × longer than wide. *Metasoma.* 1st tergum with weak, smooth, longitudinal ridge anteriorly (cf. Fig. 14d); 1st tergum 1·2 × longer than wide; 2nd plus 3rd tergum 1·4 × longer than wide; 2nd tergum with transverse depression (cf. Fig. 14d); 3rd tergum lacking transverse depression (cf. Fig. 14d); ovipositor 0·6 × body length, 2·1 × length of hind femur.

Length. 8·1 mm.

VARIATION ♀. The ♀ paratype is essentially as in the holotype.

DISTRIBUTION AND MATERIAL EXAMINED. Map 5. Known only from the type locality in Para, Brazil.

Holotype ♀, **Brazil**: Para, Jacaracanga, xi.1968 (*Alvarenga*) (AEI).

Paratype. 1 ♀, same data as holotype.

Alabagrus maya sp. n.

(Map 9)

Holotype ♀. *Colour.* Black except orange as follows: fore coxa, mid coxa and tarsus, hind leg except tarsus, propleuron, metepimeron, metapleuron, tegula, metanotum, propodeum and metasoma; fore wing infuscate (cf. Fig. 16).

Head. Antenna with 37 flagellomeres; gena right angled posteroventrally (cf. Fig. 2d). *Mesosoma.* Notauli deeply impressed (cf. Fig. 9b); scutum with weak, median, longitudinal ridge (cf. Fig. 9b); scutellar furrow smooth with weak indication of median longitudinal carinae present posteriorly (cf. Fig. 7c); apex of scutellum (posterior) smooth, lacking rugae and ridge (cf. Fig. 8a); sternaulus reduced, represented by 2 large foveae posteroventrally (cf. Fig. 5f); border between metepisternum and metepimeron crenulate (cf. Fig. 5d); metapleuron smooth with some crenulae on margins (cf. Fig. 4d); propodeum areolate (cf. Fig. 4a, lateral longitudinal carinae weaker than in figure); mid tibia with 5 preapical spines; hind tibia with 10 apical spines; hind femur smooth ventrally (cf. Fig. 3e), 3·7 × longer than wide. *Metasoma.* 1st tergum with long, strong, median carina (cf. Fig. 13a); 1st tergum 1·2 × longer than wide; 2nd plus 3rd tergum 1·2 × longer than wide; 2nd tergum with transverse depression (cf. Fig. 13b); 3rd tergum with weak transverse depression (cf. Fig. 13b); ovipositor 0·7 × body length, 2·5 × longer than hind femur.

Length. 7·0 mm.

Allotype ♂. Essentially as in ♀ holotype except transverse depression of 3rd metasomal tergum well impressed.

Variation ♂ ♀. Colour somewhat variable; can be entirely orange except some leg segments; fore coxa, mid coxa and tarsus yellow to black; hind leg can be entirely black except coxa; metasoma apically orange to black; propodeal sculpture variable, lateral longitudinal carina present or absent posteriorly; median longitudinal carina present or absent in anterior median areola; length 5·6–8·9 mm.

Distribution and Material examined. Map 9. Colombia north to southern Mexico.

Holotype, ♀, **Mexico**: Veracruz, San Andres, 30.i.1957 (USNM).

Paratypes. **Belize**: 2 ♀, 1 ♂ (USNM). **Colombia**: Antioquia: 1 ♀, Medellin, Toro (USNM); Valle de Cauca: 3 ♀, 2 ♂, Mun. Candelaria, Finca San Luis (1,010 m), tropical dry forest, iv.–ix.1975 (*Wilkerson*) (FSCA). **Costa Rica**: 1 ♂, Limon, 10°00′N, 83°01′W, 30.v.–6.vi.1969 (*Geijskes*) (RNHL). **Mexico**: allotype ♂, same data as holotype. Tabasco: 1 ♀, 20 km W. Cardenas, 21.vi.1981 (*Letourneau*) (TAMU); 1 ♂, Jalapa (*Crawford*) (USNM); 1 ♂, Teapa, 29.vi.1964 (*Pallister*) (AMNH); Veracruz; 2 ♀, same datas as holotype; 2 ♂, Acayucan, 23.x.1957 (*Dreisbach*) (MSUE); 1 ♀, Lake Catamaco, 8.–16.viii.1960 (*Howden*) (CNC); 1 ♀, 1 ♂, Minatitlan, 26.viii.–1.ix.1961 (*Dreisbach*) (MSUE); Minatitlan, 21.ix.1961 (*Dreisbach*) (MSUE); 1 ♀, 11·2 km E. Tlapacoyan, 17.viii.1958 (*Howden*) (CNC). **Venezuela**: Yaracuy: 2 ♀, Nirqua, 8.i.1979, ex pupae in (sweet potato) *Ipomoea batata* (*Montagne*) (UCV); state ?: 1 ♀, 2 ♂, El Valle, nr Caracas, 15.i.1927 (*Box*) (USNM); 1 ♂, San Esteban Valley, Las Quiguas, 1.–20.xii.1939 (*Anduze*) (USNM).

Alabagrus miqa sp. n.

(Map 20)

Holotype ♀. *Colour.* Head black except palpi yellow; mesosoma brownish black except metanotum, tegula, propodeum, hind trochanter and hind coxa posteriorly orange; legs all brownish black except fore and mid tarsi yellow; metasoma orange except black distad segment 5; fore wing infuscate except stigma yellow distally (similar to Fig. 17e but with smaller yellow area on stigma).

Head. Antenna with 41 flagellomeres; gena acute posteroventrally (cf. Fig. 2e). *Mesosoma.* Notauli deeply impressed (cf. Fig. 7a); scutum with weak longitudinal ridge (cf. (b); scutellar furrow smooth with weak indication of median longitudinal carina posteriorly (cf. Fig. 7c); apex of scutellum smooth, lacking transverse ridge and rugae (cf. Fig. 8a); median areola of metanotum not excavated, lacking elevated posterior margin (cf. Fig. 7b); sternaulus weak, represented by several large foveae posteroventrally (cf. Fig. 5f); border between metepisternum and metepimeron crenulate (cf. Fig. 5d); metapleuron smooth except for crenulae on margins (cf. Fig. 5c); propodeum smooth (cf. Fig. 10c); mid tibia with 3 preapical spines; hind tibia with 5 apical spines, hind femur smooth ventrally (cf. Fig. 3e), 3·8 × longer than wide. *Metasoma.* 1st tergum with strong, long, median, longitudinal carina (cf. Fig. 13b); 1st tergum 1·3 × wider than long; 2nd plus 3rd tergum as wide as long; both tergum 2 and tergum 3 with transverse depression (cf. Fig. 13b); ovipositor slightly shorter than metasoma, 0·9–1·0 × as long as metasoma, 2·3 × as long as hind femur.

Length. 7·0 mm.

DISTRIBUTION AND MATERIAL EXAMINED. Map 20. Known only from southern Mexico near the Gulf of Mexico.

Holotype ♀, **Mexico**: Tabasco, Teapa, ii.1904 (*Godman & Salvin*) (BMNH).

Paratype. **Mexico**: Vera Cruz: 1 ♀, Atoyac, v.1904 (*Godman & Salvin*) (BMNH).

Alabagrus misa sp. n.

(Map 11)

HOLOTYPE ♀. *Colour.* Yellow, yellowish orange and black; black as follows: head except mouthparts and clypeus, pronotum anteriorly, propleuron, parts of hind tarsus, metasoma in distal third; hind tibia brownish yellow in distal fifth; fore wing banded from base as follows: yellow, infuscate, yellow, infuscate (cf. Fig. 18d).

Head. Antenna with 45 flagellomeres; gena acute posteroventrally (cf. Fig. 2e). *Mesosoma.* Notauli deeply impressed (cf. Fig. 7d); median longitudinal ridge of scutum present (cf. Fig. 7d); scutellar furrow smooth, lacking longitudinal carinae (cf. Fig. 8a); apex of scutellum smooth with trace of transverse ridge (cf. Fig. 7d); sternaulus weak, represented by several foveae posteroventrally and shallow groove 0·5 × length of mesopleuron (cf. Fig. 4f); metapleuron smooth (cf. Fig. 5d); suture between metepimeron and metepisternum smooth (cf. Fig. 5d); propodeum smooth (cf. Fig. 10c); carinae between propodeum and metapleuron reduced, absent anteriorly; mid tibia with 2 preapical spines; hind tibia with 3 apical spines; hind femur smooth ventrally (cf. Fig. 3e), 4·2 × longer than wide. *Metasoma.* 1st tergum evenly convex, without distinct bump anteromedially (cf. Fig. 14b); 1st tergum 1·5 × longer than wide; 2nd plus 3rd tergum 1·6 × longer than wide; 2nd tergum with weak transverse depression (cf. Fig. 14b); 3rd tergum lacking transverse depression (cf. Fig. 14d); ovipositor 0·9 × body length, 3·6 × length of hind femur.

Length. 8·9 mm.

VARIATION ♀. Clypeus sometimes entirely black, basal two-thirds of metasoma sometimes with black mottling; median areola of metanotum always shallow and often lacking raised posterior border (cf. Fig. 9a); length 8·2–9·0 mm.

DISTRIBUTION AND MATERIAL EXAMINED. Map 11. Trinidad and Venezuela.

Holotype ♀, **Trinidad**: St George, St Augustine, 15.vii.–13.viii.1976 (*Noyes*) (BMNH).

Paratypes. **Trinidad**: 1 ♀, Pass, Blanchisseuse Road, 500 m, 18.ii.1964 (*Rozen & Wygodzinsky*) (AMNH); 1 ♀, Simia nr Arima, 250 m, 25.xi.–3.xii.1977 (*Mason*) (CNC). **Venezuela**: Carabobo: 2 ♀, San Esteban Valley, Las Quiguas, 1.–20.xii.1939 (*Anduze*) (USNM).

Alabagrus mixcoatl sp. n.

(Map 9)

HOLOTYPE ♀. *Colour.* Black, orange, reddish black, yellow; palpi and fore tarsus yellow; propodeum and hind femur deep reddish black; hind coxa orange, metasoma orange in anterior two-thirds with black mottling and black in posterior third; fore wing infuscate distally, clear in basal third (cf. Fig. 17b).

Head. Antenna with 47 flagellomeres; gena with obtuse angle posteroventrally (cf. Fig. 2c). *Mesosoma.* Notauli well impressed (cf. Fig. 7d); scutum with median longitudinal ridge (cf. Fig. 7ds); scutellar furrow with weak median ridge (cf. Fig. 7d); apex of scutellum with rugose transverse ridge (cf. Fig. 7d); sternaulus foveolate, 0·5 × length of mesopleuron (cf. Fig. 4a); border between metepisternum and metepimeron crenulate (cf. Fig. 5d); metapleuron mostly smooth with rugae in ventral fifth and along margins (cf. Fig. 6a); propodeum areolate, anterior transverse carinae absent (cf. Fig. 9b); mid tibia with 9 preapical spines; hind tibia with 18 apical spines; hind femur smooth ventrally (cf. Fig. 3e), 3·4 × longer than wide. *Metasoma.* 1st tergum with weak longitudinal ridge anteriorly (cf. Fig. 14d); 1st tergum 1·1 × longer than wide; 2nd plus 3rd tergum 1·1 × longer than wide; both tergum 2 and 3 with transverse depression at midlength (cf. Fig. 14b); ovipositor 0·7 × body length, 3·2 × length of hind femur.

Length. 10·4 mm.

VARIATION ♀. Both paratypes differ from the holotype as follows: propodeum entirely black, metasoma black except 1st and 2nd segments orange; scutellar groove smooth, lacking carina.

DISTRIBUTION AND MATERIAL EXAMINED. Map 9. Western Mexico.

Holotype ♀, **Mexico**: Sinaloa, 32 km E. Villa Union, 235 m, 19.viii.1964 (*Schlinger*) (USNM).

Paratypes. **Mexico**: Jalisco: 1 ♀, Chamela, 1.–8.x.1985 (*Parker & Griswold*) (CNC); Nayarit: 1 ♀, Ahuacatlan, 18.–22.vii.1951 (*Hurd*) (USNM).

Alabagrus mocovi sp. n.

(Map 3)

Holotype ♀. *Colour.* Black and orange with some yellow; palpi and distal half of the fore and mid legs yellow; hind coxa yellow ventrally; orange as follows, hind leg except coxa and tarsus, metanotum, propodeum, metapleuron and all but apical tip of metasoma; remainder of body black; fore wing mostly infuscate with basal area and stigmal area yellowish clear (cf. Fig. 19c).

Head. Antenna with 51 flagellomeres; gena right angled posteroventrally (cf. Fig. 2d). *Mesosoma.* Notauli deeply impressed (cf. Fig. 7d); scutum with median longitudinal ridge (cf. Fig. 7d); scutellar furrow with median longitudinal carina (cf. Fig. 7d); apex of scutellum with smooth transverse ridge (cf. Fig. 8d); sternaulus foveolate, 0·5 × length of mesopleuron, foveae large (cf. Fig. 5c); border between metepisternum and metepimeron crenulate (cf. Fig. 5d); metapleuron smooth medially with weak rugae on margins (cf. Fig. 5c); propodeum areolate, anterior transverse carina weak (cf. Fig. 9b); mid tibia with 1 preapical spine; hind tibia with 7 apical spines; hind femur smooth ventrally (cf. Fig. 3e), 4·0 × longer than wide. *Metasoma.* 1st tergum with strong anteromedial bump (cf. Fig. 15d), 1st tergum 1·1 × as long as wide; 2nd plus 3rd tergum 1·2 × longer than wide; 2nd tergum with and 3rd tergum without transverse depression (cf. Fig. 14d); ovipositor 0·6 × body length, 2·2 × length of hind femur.

Length. 7·9 mm.

Allotype ♂. As in holotype except as follows: hind femur and tibia mostly black; antenna with 42 flagellomeres; anterior areola of propodeum triangular; length 7·2 mm.

Variation ♀ ♂. Propodeum and metapleuron yellowish orange contrasting with reddish orange metasoma; posterior transverse ridge of scutellum weak to strong (cf. Figs 7b, 8d) and smooth to weakly rugose; anterior transverse carina of propodeum weak or only indicated medially; length 6·7 to 7·7 mm.

Distribution and Material examined. Map 3. Northern Argentina.

Holotype ♀, **Argentina**: Salta, Oran, Abra Grande, 18.iv.–5.v.1969 (*Porter*) (MCZ).

Paratypes. **Argentina**: Salta: allotype ♂, same data as holotype; 4 ♀, 4 ♂, same data as holotype; 1 ♀, Oran, Aguas Blancas, iii.1958 (*Wale*) (SC); 4 ♀, Rio Pescado, 19.–25.xi.1967 (*Porter & Willink*) (MCZ); 1 ♀, Rio Pescado, 10.v.1969 (*Porter*) (MCZ).

Alabagrus mojos sp. n.

(Fig. 18d, Map 2)

Holotype ♀. *Colour.* Yellow except as follows: head excluding palpi black; brown as follows: hind coxa distolaterally, hind trochanter, hind tarsus and tibia distally; 7th and 8th metasomal terga; fore wing banded from base as follows: yellow, infuscate, yellow, infuscate (Fig. 18d).

Head. Antenna with 37 flagellomeres; gena right angled posteroventrally (cf. Fig. 2d). *Mesosoma.* Notauli deeply impressed (cf. Fig. 8a); median longitudinal ridge of scutum lacking (cf. Fig. 8a); scutellar furrow with median longitudinal carina (cf. Fig. 8c); apex of scutellum with sharply defined, rugose, transverse ridge (cf. Fig. 8d); sternaulus short, 0·3 × length of mesopleuron, represented by 1 or 2 foveae posteroventrally (cf. Fig. 5f); border between metepisternum and metepimeron crenulate (cf. Fig. 5d); metapleuron mostly smooth with crenulae along ventral margin; propodeum areolate, anterior transverse carina absent, anterior areola poorly defined (cf. Fig. 8c); mid tibia with 2 preapical spines; hind tibia with 3 apical spines; hind femur smooth ventrally (cf. Fig. 3e), 4·5 × longer than wide. *Metasoma.* 1st tergum with weak longitudinal bump medially (cf. Fig. 14a); 1st tergum 1·8 × longer than wide; 2nd plus 3rd tergum 1·5 × longer than wide; 2nd tergum with weak indication of transverse depression (cf. Fig. 14b); 3rd tergum lacking transverse depression (cf. Fig. 14d); ovipositor 0·7 × body length, 2·8 × length of hind femur.

Length. 7·0 mm.

Allotype ♀. As in holotype ♀ except as follows: 3rd tergum and following partly brown; fore wing evenly infuscate (cf. Fig. 16); antenna with 35 flagellomeres; propodeal sculpture complete, anterior transverse carina present (cf. Fig. 7d); length 5·3 mm.

Variation ♀ ♂. Coloration varies considerably, from all yellow or orange to any combination of yellow and brown, yellow and black, or orange and black; fore wing of most males banded as in all females; mid tibia with 0–3 preapical spines; hind tibia with 2–4 apical spines; sternaulus can be well foveolate and 0·5 length of mesopleuron (cf. Fig. 4a); propodeum from almost completely smooth in some females (cf. Fig. 7c) to completely areolate in most males (cf. Fig. 7d); anterior transverse carina of propodeum always absent in females; 1st tergum of metasoma with or without small median ridge in males (cf. Fig. 13d), ridge always absent in females; body length 5·3–7·7 mm.

DISTRIBUTION AND MATERIAL EXAMINED. Map 2. Widespread, from Guatemala south to northern Argentina.

Holotype ♀, **Ecuador**: Napo Prov., Limoncocha, 250 m, 15.–28.v.1976 (*Peck*) (CNC).

Paratypes. **Argentina**: Salta: 4 ♀, Rio Pescado, v.–vii.1970 (*Porter*) (IML); 1 ♀, Rio Pescado, 30.iv.1968 (*Porter*) (MCZ); 1 ♀. Camp. Jakulica nr Aguas Blancas, x.1968 (*Porter*) (MCZ); 3 ♀, Oran, Abre Grande 18.iv.–5.v.1969 (*Porter*) (MCZ); 1 ♀, nr Aguas Blancas, 1.v.1968 (*Porter*) (MCZ); 7 ♀, 24 km NW. Aguas Blancas, 9.v.1969 (*Porter*) (MCZ). **Bolivia**: Santa Cruz; 2 ♂, Buena Vista, 10.vii.1972 (*Porter & Stange*) (IML); 1 ♀, Saavedra, Agr. Exp. Sta., i.1974 (*Porter*) (FSCA); 1 ♀, Cochabamba, 17 km E. Villa Tunari, 15.–21.vii.1973 (*Porter & Strange*) (IML); La Paz: 4 ♀, Mapiri (TMB). **Brazil**: Bahia: 1 ♀, Bahia, Cepec Itabuna, 25.v.1978 (*Benton*) (BMNH); 1 ♂, Cepec Itabuna, 9.–13.iv.1983 (*Benton*) (MCZ); Espirito Santo: 2 ♂, Parque Sooretama, Linhares, xi.1967 (*Oliveira*) (AEI); Goias: 1 ♀, Jatai, xi.1972 (*Oliveira*) (AEI); Guanabara: 14 ♀, 4 ♂, Represa Rio Grande, i., ii., v., xi., x., xii., 1966–1967 (AEI); Mato Grosso: 1 ♀, 12°50′S 51°47′W, 23.iv.1968 (*Richards*) (BMNH); Para: 2 ♀, date ? (*Baker*) (USNM); 1 ♂, Belem, 29.vii.–6.viii.1974 (*Young*) (FSCA); 4 ♀, 2 ♂, Jacareacanga, xii.1968 (*Alvarenga*) (AEI); 1 ♀, Rio Acara (1930) (*Horvath*) (TMB); Rio de Janeiro: 1 ♀, Botanical Gardens, 1923 (*Hancock*) (BMNH); 2 ♀, viii.1974 (*Oliveira*) (AEI); 2 ♀, 2 ♂, Mangaratiba, Muriqui, vii.1969 (*Alvarenga*) (CNC); 1 ♂, Silva Jardin, viii.1974 (*Oliveira*) (CNC); Rondonia: 2 ♀, Vilhena, xi.1973 (*Alvarenga*) (AEI); Santa Catarina: 1 ♀, Joinvile, 8.–9.ii.1969 (*Porter & Garcia*) (MCZ); Sao Paulo: 1 ♀, Aracatuba, x.1961 (*Lane & Ranelo*) (MZSP); 1 ♀, Sinop, x.1974 (*Alvarenga*) (CNC); 1 ♀, Itaum, iii.1974 (*Alvarenga*) (AEI). **Colombia**: Valle de Cauca: 1 ♀, Anchicaya, 15.xii.1977 (*Tidwell*) (FSCA); 2 ♀, 30 km E. Buenaventura, very wet forest, 560 m, 13.–16.vii.1975 (*Wilkerson*) (FSCA). **Costa Rica**: Alajuela: 1 ♀, 4 km W. La Fortuna, 400 m, 18.ii.1964 (*Evans*) (MCZ). **Ecuador**: Napo: allotype ♂, same data as holotype; 6 ♀, 1 ♂, same data as holotype; 1 ♀, Limoncocha, 19.iii.1974 (*Drummond*) (FSCA); 1 ♂, Puerto Misahualli, 20.ii.1983 (*Huggert*) (CNC); 1 ♀, Tena, 18.ii.1983 (*Huggert*) (CNC); 1 ♀, 10 km NE. Tena, 400 m, 19.–20.ii.1983 (*Masner*) (CNC); Pinchincha: 1 ♀, 1 ♂, 47 km S. Sta. Domingo, Rio Palenque Res. Sta., 22.–31.vii.1976 (*Peck*) (CNC); Quevedo: 2 ♂, Los Rios, v.1976 (*Fritz*) (AEI). **Guatemala**: 1 ♀, Cayuga, ii. (*Schaus & Barnes*) (USNM). **Guyana**: 3 ♀, Bartica, i.–ii.1913 (CU); 1 ♂, 3.iv.1901 (*Crew*) (CU). **Panama**: Canal Zone: 1 ♀, Barro Colorado I., v.1939 (USNM); 1 ♂, Barro Colorado I., 14.vi.1939 (*Zetek*) (USNM); 1 ♀, Margarita, iv.1960 (*Breeland*) (AEI). **Paraguay**: 10 ♂, Carumbe, ii.–iii.1966 (*Golbach*) (AEI). **Peru**: Cuzco: 3 ♀, Quince Mil, x.–xi.1962 (SC); 1 ♀, Avispas, 1.–15.x.1962 (SC); 1 ♀, Avispas 1.–15.x.1962 (*Pena*) (AEI); Huanuco: 1 ♀, Tingo Maria, 20.27.i.1968 (*Garcia & Porter*) (MCZ); 5 ♀, Tingo Maria, Cueva de Las Pavas, 23.–27.vii.1982 (*Porter & O'Neill*) (FSCA); Loreto: 2 ♀, Pucallpa, 23.i.1962 and 14.v.1962 (*Schunke*) (BMNH); 1 ♂, 2 km from Iquitos, v.–vi.1976 (*Kingston*) (BMNH); Madre de Dios: 1 ♂, Puerto Maldonado, 6.i.1984 (*Huggert*) (CNC). **Surinam**: 1 ♂, Chavlesburg, Krepi, 13.–14.i.1964 (*Geijskes*) (RNHL); 1 ♂, Kabalebo River, Avanavero Falls, 5.–12.iv.1971 (*Geijskes*) (RNHL); 1 ♀, Marowijne River, vii.1965 (*Gale*) (BMNH); 1 ♂, Onverdacht, Biliton, 29.xi.1968 (*Van Doesburg*) (RNHL); 6 ♂, 2 ♀, Paramaribo, Plantation Ma Retraite, i.–ii.1964 (*Geijskes*) (RNHL); 1 ♀, Morico-Kreek, 14.vi.1963 (*Van Doesburg*) (RNHL); 1 ♀, Republiek, 18.–23.xi.1963 (*Geijskes*) (RNHL); 1 ♀, Republiek, 23.–26.x.1963 (*Geijskes*) (AEI). **Venezuela**: Bolivar: 1 ♀, Auyantepui, 1100 m, 20.iv.1956 (*Fernandez & Rosales*) (UCV); 1 ♂, El Hormiguero Meseta de Nuria, 500 m, 13.–17.xii.1974 (UCV); Carabobo: 1 ♂, San Esteban Valley, Las Quiquas, 1.–20.xii.1939 (*Anduze*) (USNM); 3 ♂, San Esteban Valley, Las Quiquas, 20.–27.i.1940 (*Anduze*) (USNM); 1 ♂, San Estaban, 1.–20.xii.1939 (*Anduze*) (AEI); Miranda: 1 ♂, Guatopo, 600 m, 28.iii.1965 (*Bechyne*) (UCV).

Alabagrus muisca sp. n.

(Map 14)

HOLOTYPE ♀. *Colour.* Black and orange with palpi and fore tarsus yellow; orange as follows, propodeum, metapleuron, anterior 3 segments of metasoma, hind coxa except black patch distolaterally and hind femur except black in proximal third; fore wing clear basally and around stigma, otherwise infuscate (cf. Fig. 20d, but with stigma melanic).

Head. Antenna with 41 flagellomeres; gena right angled posteroventrally (cf. Fig. 2d). *Mesosoma.* Notauli deeply impressed (cf. Fig. 7d); scutum with median longitudinal ridge (cf. Fig. 7d); scutellar furrow smooth, lacking longitudinal carinae (cf. Fig. 8a); apex of scutellum with weak, smooth, transverse, ridge (cf. Fig. 7d); sternaulus 0·3 × length of mesopleuron, composed of 2 or 3 large foveae (cf. Fig. 5f); border between metepisternum and metepimeron crenulate (cf. Fig. 5d); metapleuron mostly smooth with crenulae along margins (cf. Fig. 5c); propodeum areolate, anterior transverse carina complete, strong (cf. Fig. 7d); mid tibia with 2 preapical spines; hind tibia with 7 apical spines; hind femur smooth ventrally (cf. Fig. 3e), 3·4 × longer than wide. *Metasoma.* 1st tergum evenly, strongly convex (much more than in Fig.

14b), as long as wide; 2nd plus 3rd tergum 1·3 × longer than wide; 2nd tergum with and 3rd tergum without transverse depression (cf. Fig. 14d); ovipositor 0·9 × body length, 3·4 × length of hind femur.

Length. 7·8 mm.

VARIATION ♀. The sole paratype differs from the holotype as follows: most of hind coxa and lateral portions of metasoma yellow; stigma brownish yellow; sternaulus 0·5 × length of mesopleuron, with large foveae; length 7·6 mm.

DISTRIBUTION AND MATERIAL EXAMINED. Map 14. Known from Trinidad and Colombia, presumably widespread in northern South America.

Holotype ♀, **Trinidad**: Piarco, 27.ii.1961 (*Gopaul*) (CNC).

Paratype. **Colombia**: Valle de Cauca: 1 ♀, Rio Frio, iii.1924 (*Mann*) (USNM).

Alabagrus nahuatl sp. n.

(Fig. 20e, Map 21)

HOLOTYPE ♀. *Colour*. Black, reddish orange and brown; palpi, fore and mid tarsus brown; reddish orange as follows: metanotum, metapleuron, propodeum, hind femur, and metasoma except terminally and along ventral midline black; fore wing clear basally, infuscate distad 1*RS* cell (Fig. 20e).

Head. Antenna with 46 flagellomeres; gena rounded posteroventrally (cf. Fig. 2e). *Mesosoma*. Notauli deeply impressed (cf. Fig. 7d); scutum with median longitudinal ridge (cf. Fig. 7d); scutellar furrow with weak median longitudinal carina indicated posteriorly (cf. Fig. 7d); apex of scutellum with weak rugose transverse ridge (cf. Fig. 7c); sternaulus deeply impressed with large foveae extending 0·6 × length of mesopleuron (cf. Fig. 4c); posterior margin of epicnemium with large crenulae (cf. Fig. 4c); border between metepisternum and metepimeron crenulate (cf. Fig. 5d); metapleuron rugose ventrally and all margins crenulate (cf. Fig. 4c); propodeum areolate with anterior transverse carinae lacking (cf. Fig. 9b); mid tibia with 6 preapical spines; hind tibia with 14 apical spines; hind femur rugose ventrally (cf. Fig. 3c), 3·2 × longer than wide. *Metasoma*. 1st tergum with weak median longitudinal bump anteriorly (cf. Fig. 14a); 1st tergum as long as wide; 2nd plus 3rd tergum 1·1 × longer than wide; 2nd tergum with transverse depression (cf. Fig. 14d); 3rd tergum lacking transverse depression (cf. Fig. 14d); ovipositor 0·8 × body length, 3·4 × length of hind femur.

Length. 9·6 mm.

ALLOTYPE ♂. As in ♀ holotype except as follows: fore and mid tarsi yellow, metanotum black, sternaulus complete to epicnemium (cf. Fig. 4c); mid tibia with 10 preapical spines, hind tibia with 17 apical spines; hind femur 3·1 × longer than wide (antennae broken after segment 43); body length 9·3 mm.

VARIATION ♀ ♂. Lateral lobes of scutum rarely (2%) reddish orange, fore wing from almost completely infuscate (cf. Fig. 16) to clear in basal two-thirds (Fig. 20e); posterior transverse carinae of scutellum from smooth and indistinct (cf. Fig. 7d) to rugose and strong (cf. Fig. 7a); median longitudinal carina of propodeum can divide anterior areola (cf. Fig. 10f); mid tibia with 3–10 preapical spines; hind tibia with 8–17 spines; hind femur 2·9–3·2 × longer than wide; body length 9·3 –10·5 mm.

DISTRIBUTION AND MATERIAL EXAMINED. Map 21. Mexico, from Jalisco south to Guerrero and east to Vera Cruz.

Holotype ♀, **Mexico**: Morelos, 12 mi [19 km] E. Cuernavaca, 4300′ [1,300 m], 14.viii.1954 (*Chillcott*) (CNC).

Paratypes. **Mexico**: allotype ♂, Morelos, Alpuyeca, 3.vii.1951 (*Hurd*) (UCB); Guerrero: 2 ♀, Chilpancingo, 4600′ [1480 m] i.1904 (*Smith*) (BMNH); Jalisco: 1 ♀, Chamela, 1.–8.x.1985 (*Parker & Griswald*) (CNC); Morelos: 1 ♀, Cuenavaca, 15.viii.1954 (*Dreisbach*) (USNM); 1 ♀, Xochicalco Pyramid, 16.vii.1963 (*Parker & Stange*) (USNM); Vera Cruz: 1 ♀, 4·8 km W. Paso de Ouejas, 17.viii.1959 (*Stange & Menke*) (USNM); State?: 1 ♀, Puente Nacional (*Painter*) (AEI).

Alabagrus nicoya sp. n.

(Fig. 15c, Map 19)

HOLOTYPE ♀. *Colour*. Black and orange; orange as follows: palpi distally, parts of fore tarsus, propodeum, metapleuron, hind coxa and femur, entire metasoma except ventral midline somewhat darker; fore wing yellowish hyaline in basal two-thirds, infuscate distally (cf. Fig. 19a).

Head. Antenna with 47 flagellomeres; gena rounded posteroventrally (cf. Fig. 2b). *Mesosoma*. Notauli well impressed (cf. Fig. 7d); scutum with median longitudinal ridge (cf. Fig. 7d); scutellar groove with 4

weak longitudinal carinae (cf. Fig. 9c); apex of scutellum with rugose transverse ridge (cf. Fig. 7a); sternaulus foveolate, 0·8 × length of mesopleuron, almost reaching epicnemium (cf. Fig. 4c); border between metepisternum and metepimeron crenulate (cf. Fig. 5d); metapleuron rugose in ventral half, with crenulae on margins (cf. Fig. 4c); propodeum areolate, very wide (cf. Fig. 7a), anterior transverse carina absent (cf. Fig. 9b); mid tibia with 5 preapical spines; hind tibia with 10 apical spines; hind femur rugose ventrally (cf. Fig. 3c), 2·7 × longer than wide. *Metasoma.* 1st tergum convex (cf. Fig. 15c); 1st tergum 0·7 × as long as wide; 2nd plus 3rd tergum 0·9 × as long as wide; 2nd tergum with transverse depression (cf. Fig. 14d); 3rd tergum lacking transverse depression (cf. Fig. 14d); ovipositor 0·8 × body length; 3·5 × length of hind femur.

Length. 9·3 mm.

VARIATION ♀. Sole paratype essentially as in holotype.

DISTRIBUTION AND MATERIAL EXAMINED. Map 19. Known only from the type locality in north-western Costa Rica.

Holotype ♀, **Costa Rica**: Guanacaste, Santa Rosa Park, 5.vi.1978 (*Janzen*) (AEI).

Paratype. **Costa Rica**: 1 ♀, Guanacaste, Santa Rosa Park, 5.vii.1977 (*Janzen*) (AEI).

Alabagrus nigritulus (Szépligeti) comb. n.

(Figs 7d, 15d, Map 8)

Microdus nigritulus Szépligeti, 1902: 76. Holotype ♀, Brazil (TMB) [examined].
Cremnops punctipennis Cameron, 1911: 322. Holotype ♂, Guyana (BMNH) [examined].

HOLOTYPE ♀. *Colour.* Black, dark brown, red-orange, and yellow; palpi yellow, head black, fore and mid tarsi yellow (fore tarsi broken on type); mesosoma all dark brown to black except fore and mid coxae yellow; metasoma red-orange anteriorly, fore wing infuscate (cf. Fig. 16).

Head. Antenna with about 41 flagellomeres (broken on type); gena acute posteroventrally (cf. Fig. 2e). *Mesosoma.* Notauli well impressed (Fig. 7d); scutum with median longitudinal ridge (Fig. 7d); scutellar furrow with weak median carina (Fig. 7d); apex of scutellum with weak smooth transverse ridge (Fig. 7d); sternaulus foveolate, 0·6 × length of mesopleuron (slightly longer than in Fig. 5c); border between metepisternum and metepimeron crenulate (cf. Fig. 5d); metapleuron mostly smooth except for crenulae on margins (cf. Fig. 5c); propodeum areolate, anterior transverse carina absent; anterior and posterior median areolae subequal (cf. Fig. 9b); mid tibia with 2 preapical spines; hind tibia with 3 apical spines; hind femur rugose punctate ventrally (cf. Fig. 3b), 3·9 × longer than wide. *Metasoma.* 1st tergum with strong anteromedial bump (Fig. 15d); 1st tergum 1·2 × longer than wide; 2nd plus 3rd tergum 1·3 × longer than wide; 2nd tergum with weak transverse depression incomplete medially (cf. Fig. 14d); 3rd tergum lacking transverse depression (cf. Fig. 14d); ovipositor 0·9 × body length, 3·4 × length of hind femur.

Length. 6·7 mm.

MALE. Essentially as in female holotype except as follows: apex of scutellum with rugose transverse ridge (cf. Fig. 7a); propodeum with anterior transverse carina complete (Fig. 7d); hind femur heavily rugose ventrally (cf. Fig. 3c); 1st metasomal tergum lacking pronounced bump (cf. Fig. 14d); in general body sculpture stronger than in most female specimens.

VARIATION ♀ ♂. This species shows a considerable amount of variation especially in coloration; specimens vary from completely black except for red colour on metasoma basally to black anteriorly and orange posteriorly; lightest specimens with orange as follows: mesepimeron, metanotum, propodeum, metapleuron, hind coxa, hind femur and metasoma; fore wing infuscate but sometimes lighter basally and/or near stigma (cf. Figs 17b, 17d, 19b); sternaulus can be shorter than in holotype (cf. Fig. 5c); sculpture of propodeum much reduced, even smooth (cf. Fig. 10c); anterior median areola of propodeum usually at least faintly indicated (cf. Fig. 7c); anterior transverse carina absent on most female specimens (cf. Fig. 9b), present on most males (Fig. 7d); 1st metasomal tergum variable (cf. Figs 14b, 15d); length 5·4–8·0 mm.

DISTRIBUTION AND MATERIAL EXAMINED. Map 8. Widespread in the neotropics from San Luis Potosi, Mexico, to northern Argentina.

Holotype ♀, *Microdus nigritulus*, **Brazil**: 'Brisilien, Villa Bella' (TMB, No. 704). Holotype ♂, *Cremnops punctipennis*, **Guyana** 'British Guiana' (BMNH).

Specimens that I have determined are in the following collections: AEI, BMNH, CNC, CU, FSCA, MCZ, MSUE, NHMV, RNHL, SC, TMB, UCV, USNM, ZMHB.

Alabagrus nio sp. n.

(Map 10)

Holotype ♀. *Colour.* Black, reddish orange and yellow; palpi, fore and mid tarsi yellow; reddish orange as follows: metapleuron, propodeum, hind coxa, hind femur and tibia proximally, and metasoma; fore wing infuscate (cf. Fig. 16).

Head. Antenna with 42 flagellomeres; gena rounded posteroventrally (cf. Fig. 2b). *Mesosoma.* Notauli well impressed (cf. Fig. 9b); anterior longitudinal ridge of scutum very weak (cf. Fig. 9b); scutellar furrow with median carina (cf. Fig. 7d); apex of scutellum with weak rugae (cf. Fig. 7c); sternaulus short, composed of two large foveae posteroventrally (cf. Fig. 5f); border between metepisternum and metepimeron crenulate (cf. Fig. 5d); metapleuron mostly smooth with crenulae on margins (cf. Fig. 5f); propodeum areolate, anterior transverse carina mostly absent (cf. Fig. 9b); mid tibia with 4 preapical spines; hind tibia with 8 apical spines; hind femur smooth ventrally (cf. Fig. 3e), 3·1 × longer than wide. *Metasoma.* 1st tergum with small median, longitudinal bump (cf. Fig. 14a); 1st tergum 1·1 × longer than wide; 2nd plus 3rd tergum as wide as long; 2nd tergum with transverse depression (cf. Fig. 14d); 3rd tergum lacking transverse depression (cf. Fig. 14d); ovipositor 0·8 × body length, 4·3 × length of hind femur.

Length. 7·8 mm.

Allotype ♂. As in ♀ holotype except propodeal sculpture stronger, carinae complete.

Variation ♂ ♀. Propodeal sculpture from weak, with anterior transverse carina and portions of posterior transverse carinae absent (cf. Fig. 9a); to strong with both carinae complete (cf. Fig. 7d); hind femur 3·0–3·2 × longer than wide; length 7·0–8·4 mm.

Distribution and Material examined. Map 10. Western and southern Mexico.

Holotype ♀, **Mexico**: Sinaloa, 32 km E. Concordia, 925 m, 12.viii.1964 (*Mason*) (CNC).

Paratypes. **Mexico**: Chiapas: 1 ♀, Simajovel, 18.–31.vii.1958 (*Chemsak*) (UCB); Jalisco: allotype ♂, Chamela, 26.–30.ix.1985 (*Parker & Griswold*) (CNC); Nayarit: 1 ♀, Pichon, 5.vii.1956 (*Dreisbach*) (MSUE); Sinaloa: 5 ♀, same data as holotype; 1 ♀, Mazatlan, 6.viii.1964 (*Mason*) (CNC); 3 ♀, 32 km E. Concordia, 925 m, vii.–viii.1964 (*Mason*) (CNC); Tobasco: 1 ♂, Jalapa (*Crawford*) (USNM); Veracruz: 1 ♀, Acayucan, 23.x.1957 (*Dreisbach*) (MSUE); 1 ♀, Minatitlan, 26.viii.–1.ix.1961 (*Dreisbach*) (MSUE).

Alabagrus olmec sp. n.

(Map 19)

Holotype ♀. *Colour.* Mostly orange except black as follows: head except palpi, propleuron, fore and mid legs except tarsi; hind coxa laterally, hind trochanter and tarsus and hind tibia distally; fore wing infuscate (cf. Fig. 16).

Head. Antenna with 45 flagellomeres; gena acute posteroventrally (cf. Fig. 2e). *Mesosoma.* Notauli well impressed (cf. Fig. 7d); scutum with median, longitudinal, ridge (cf. Fig. 7d); scutellar furrow lacking longitudinal carinae (cf. Fig. 8a); apex of scutellum with weak rugose ridge (cf. Fig. 7b); sternaulus foveolate, 0·6 × length of mesopleuron (cf. Fig. 4c); border between metepisternum and metepimeron crenulate (cf. Fig. 5d); metapleuron mostly smooth except some crenulae along ventral margin; propodeum areolate (cf. Fig. 7d, though anterior median areola much smaller than posterior median areola); mid tibia with 3 preapical spines; hind tibia with 3 apical spines; hind femur punctate ventrally (intermediate between Figs 3a and 3b), 3·7 × longer than wide. *Metasoma.* 1st tergum with short, median, longitudinal ridge anteriorly (cf. Fig. 13d, though not as long); 1st tergum as wide as long; 2nd plus 3rd tergum 1·2 × longer than wide; 2nd tergum with transverse depression (cf. Fig. 14d); 3rd tergum lacking transverse depression (cf. Fig. 14d); ovipositor 0·6 × body length, 2·4 × length of hind femur.

Length. 8·3 mm.

Variation ♀. Propleuron from orange to black; antenna with 41–45 flagellomeres; anterior transverse carina of propodeum strongly or weakly indicated; anterior median areola of propodeum weak to absent; length 7·0–8·3 mm.

Distribution and Material examined. Map 19. Southern Mexico and Colombia, presumably widespread but rare between the two locations.

Holotype ♀, **Mexico**: Oaxaca, Metate, 85·5 km SW. of Tuxtepec, 900 m, 21.x.1962 (*Townes*) (AEI).

Paratypes. **Colombia**: Valle de Cauca: 1 ♀, 4 km E. Zabaletas, 6.vii.1975 (*Wilkerson*) (FSCA). **Mexico**: Oaxaca: 1 ♀, same data as holotype except 18.x.1962; Veracruz: 1 ♀, Cordoba, 15.vi.year? (*Knab*) (USNM); 1 ♀, 'Mexico' (no further locality data) (BMNH).

Alabagrus oyana sp. n.

(Map 11)

Holotype ♀. *Colour.* Yellowish orange except brown as follows: antenna, lateral lobes of scutum, hind tarsus and some small patches on metasomal terga; fore wing infuscate except stigmal area yellow (cf. Fig. 19c).

Head. Antenna with about 38 flagellomeres (broken on type, number based on closely related species); gena subacute posteroventrally (slightly sharper than Fig. 2d). *Mesosoma.* Notauli deeply impressed (cf. Fig. 7d); scutum with strong median longitudinal ridge anteriorly (cf. Fig. 7d); scutellar furrow smooth (cf. Fig. 8a); apex of scutellum (posterior) with weak trace of transverse ridge (cf. Fig. 7b); sternaulus more than 0·5 × length of mesopleuron and composed of large foveae (cf. Fig. 4c); border between metepisternum and metepimeron crenulate (cf. Fig. 5d); metapleuron mostly smooth with crenulae along margins (cf. Fig. 5c); propodeum areolate (cf. Fig. 7d); mid tibia with 2 preapical spines; hind tibia with 3 apical spines; hind femur rugose ventrally (cf. Fig. 3c); 4·1 × longer than wide. *Metasoma.* 1st tergum with small, prominent, anteromedial bump (cf. Fig. 15d); 1st tergum 1·2 × longer than wide; 2nd plus 3rd tergum 1·3 × longer than wide; 2nd tergum with and 3rd tergum without transverse depression (cf. Fig. 14d); ovipositor 0·7 × body length; 2·7 × length of hind femur.

Length. 7·2 mm.

Allotype ♂. As in ♀ holotype except as follows: propodeum partly rugose laterally (cf. Fig. 8d); 1st metasomal tergum with weak median longitudinal carina (cf. Fig. 14d); length 6·5 mm. (Antennae missing from allotype.)

Distribution and Material examined. Map 11. Surinam and Guyana.

Holotype ♀, **Surinam**: Coronieweg, 15.xii.1948 (*Geijskes*) (RNHL).

Paratype. Allotype ♂, **Guyana**: Demerera River, 24.iii.1913 (CU).

Alabagrus pachamama sp. n.

(Fig. 10d, Map 3)

Holotype ♀. *Colour.* Black and yellow; black as follows: head except mouth parts; body of mesosoma except propodeum and metapleuron; metapleuron with small black area anteriorly; hind leg except coxa ventrally, femur apically and tibia basally; metasoma apically; fore wing banded from base as follows: yellow, infuscate, yellow, infuscate (cf. Fig. 20a).

Head. Antenna with 43 flagellomeres; gena acute posteroventrally (cf. Fig. 2e). *Mesosoma.* Notauli deeply impressed (cf. Fig. 7d); median longitudinal ridge of scutum present (cf. Fig. 7d); scutellar furrow smooth, lacking longitudinal carina (cf. Fig. 8a); apex of scutellum with smooth, transverse ridge (cf. Fig. 9b); median areola of metanotum not excavated, lacking raised posterior margin (cf. Fig. 9a); sternaulus weak, represented by several foveae posteroventrally and weak groove 0·3 × length of mesopleuron (cf. Fig. 5e); border between metepisternum and metepimeron crenulate (cf. Fig. 5d); metapleuron smooth (cf. Fig. 6d); propodeum smooth (cf. Fig. 10c); carinae between metapleuron and propodeum very weak, absent anteriorly; mid tibia with 2 preapical spines; hind tibia with 3 apical spines; hind femur smooth ventrally (cf. Fig. 3e), 4·6 × longer than wide. *Metasoma.* 1st tergum evenly convex, without distinct anterior bump (cf. Fig. 14b); 1st tergum 1·5 × longer than wide; 2nd plus 3rd tergum 1·5 × longer than wide; 2nd tergum with weak transverse depression (cf. Fig. 14b); 3rd tergum lacking transverse depression (cf. Fig. 14d); ovipositor 0·9 × body length, 3·2 × longer than hind femur.

Length. 8·6 mm.

Allotype ♂. Essentially as in ♀ holotype; antenna with 42 flagellomeres; length 7·8 mm.

Variation ♂ ♀. Quite variable in coloration, from almost all yellow except head to black and orange with the propodeum black; antenna with 41–45 flagellomeres; median areola of metanotum with weak posterior margin (cf. Fig. 8a); mid tibia with 0–3 preapical spines; ovipositor 0·8–1·0 × body length; length 5·8–10·0 mm.

Distribution and Material examined. Map 3. Widespread in South America, from Trinidad east to Ecuador, south to Bolivia and through the Amazon Basin.

Holotype ♀, **Ecuador**: Napo, Limoncocha, 250 m, 15.–28.vi.1976 (*Peck*) (CNC).

Paratypes. **Bolivia**: Beni: 1 ♀, Rio Itenez at mouth of Rio Baures, 25.ix.–7.x.1964 (*Bouseman & Lussenhop*) (AMNH); La Paz: 1 ♀, Mapiri (MZP). **Brazil**: Amazonas: 1 ♀, 71°38′W, 4°38′S, ix.1979 (*Alvarenga*) (AEI); 1 ♀, Manaus, Campus University, 22.–29.vi.1982 (*Rafael*) (CNC). **Colombia**: Cauca

de Valle: 1 ♀, Rio Zabaletas, Las Piedros, Rain Forest, 14.–18.vii.1975 (FSCA); 2 ♂, Triana, km 43 Blventura Street, xii.1977 (*Tidwell*) (FSCA). **Ecuador**: allotype ♂, same data as holotype; Esmeraldas: 1 ♂, Dureno, 23.–28.ix.1977, 200 m (*Pena*) (CNC); Los Rios: 3 ♀, Quevedo, v.1976 (*Fritz*) (AEI); 1 ♀, Playas de Montalvo, 15 m, 16.iv.1938 (*Clark & McIntyre*) (AEI); Napo: 18 ♀, 5 ♂, same data as holotype; 9 ♀, Limoncocha, 1.vii.1974 (*Drummond*) (FSCA); 1 ♂, Puerto Misahualli, 20.ii.1983 (*Huggart*) (CNC); 1 ♂, Tena, 400 m, 16.–17.ii.1983 (*Sharkey*) (CNC); 1 ♀, 12 km SW. Tena, 500 m, 8.–11.vii.1976 (*Peck*) (CNC); 1 ♀, Pastaza, 25 km N. Puyo, 1000 m, 4.vii.1976 (*Peck*) (CNC); Pinchincha: 2 ♀, Rio Palenque Res. Sta., 47 km S. Sta. Domingo, 22.–31.vii.1976 (*Peck*) (CNC); 1 ♀, Sto. Domongo, 215 m, 17.–30.v.1975 (*Peck*) (AEI); 1 ♀, Sto. Domingo, 680 m, 15.–30.v.1975 (*Peck*) (AEI); 1 ♀, Rio Palanque Res. Sta., 4.ii.1983, 200 m (*Masner & Sharkey*) (CNC); 1 ♀, Rio Pelanque Res. Station, ii.1983 (*Sharkey*) (CNC); state?: 1 ♀, Ongota, v.1963 (*Pena*) (AEI). **Guyana**: 7 ♀, Bartica, ii.1913 (CU); 2 ♀, Kartabo, Bartica District, 22.x.1920 and 15.iii.1922 (AMNH). **Peru**: Cuzco: 1 ♀, Quince Mil, 750 m, ix.1962 (*Pena*) (AEI); Huanuco: 12 ♀, 14 ♂, Tingo Maria, 20.–27.i.1968 (*Garcia & Porter*) (MCZ); 2 ♀, Tingo Maria, 620 m, 5.–12.x.1964 (*Porter*) (MCZ); 2 ♀, Tingo Maria, 20.–27.i.1968 (*Garcia & Porter*) (CNC); 1 ♂, Tingo Maria, 19.v.1947 (*Pallister*) (AMNH); 1 ♀, Yanayacu, Rio Pachitea, 14.viii.1961 (*Schunke*) (BMNH); Junin: 1 ♀, Chanchamayo, 1200 m, 24.v.1949 (*Schunke*) (BMNH); Loreto: 5 ♀, Pucallpa, 31.iii.1952, 22.iv.1952, 23.v.1961, 16.i.1962, 10.xi.1962 (*Schunke*) (BMNH). **Surinam**: 2 ♀, Albina, 25.vi.1963 (*Van der Vecht*) (RNHL); 1 ♀, 1 ♂, Kwakoegron, 8. and 13.vi.1927 (CU); 1 ♀, Marowijne River, vi.1965 (*Gale*) (BMNH); 1 ♂, Republiek, 18.iv.1965 (*Geijskes*) (RNHL); 2 ♀, Republiek, 16.vi.1963, 30.viii.1964 (*Geijskes*) (RNHL). **Trinidad**: sex? [abdomen broken], La Brea Ward, Parrylands, 13.ii.1980 (*Cook*) (BMNH). **Venezuela**: Aragua: 2 ♀, Rancho Grande, 1100 m, 11.vi.1980, 15.vi.1979 (*Clavijo & Yepez*) (UCV); Bolivar: 1 ♀, El Hormiguero Meseta de Nuria, 500 m, 13.–17.xii.1974 (UCV); Carabobo: 1 ♂, San Esteban Valley, Las Quiguas, and 11.–19.i.1940 (*Anduze*) (USNM); Merida: 1 ♀, Merida, 200 m, 10.v.1981 (*Masner*) (AEI).

Alabagrus paqo sp. n.

(Map 12)

Holotype ♀. *Colour.* Reddish brown with some black, yellow and orange; head black; antenna orange; yellow as follows: tegula, fore and mid legs and palpi; antenna orange; fore wing infuscate with yellow stigmal area, slightly less infuscate basally (intermediate between Figs 17e and 19c).

Head. Antenna with 42 flagellomeres; gena rounded posteroventrally (cf. Fig. 2b). *Mesosoma.* Notauli well impressed (cf. Fig. 8b); scutum lacking median longitudinal ridge (cf. Fig. 8c); scutellar furrow smooth, lacking longitudinal carinae (cf. Fig. 8c); apex of scutellum (posterior) smooth, lacking transverse ridge (cf. Fig. 8a); sternaulus weakly impressed with foveae extending 0·5 × length of mesopleuron (cf. Fig. 5c); propodeum smooth (cf. Fig. 10c); mid tibia with 2 preapical spines; hind tibia with 7 apical spines; hind femur smooth ventrally (cf. Fig. 3e), 3·7 × longer than wide. *Metasoma.* 1st tergum convex (cf. Fig. 14b); 1st tergum 1·7 × longer than wide; 2nd plus 3rd tergum 1·3 × longer than wide; 2nd tergum with transverse depression (cf. Fig. 14b); ovipositor about equal to body length, 4·5 × length of hind femur.

Length. 8·4 mm.

Allotype ♂. As in ♀ holotype except foveae of sternaulus stronger and propodeum weakly sculptured medially and laterally.

Variation ♀ ♂. The three other paratypes vary little from the allotype; anteromedial bump on 1st metasomal tergum sometimes larger.

Distribution and Material examined. Map 12. Guanabara state in south-eastern Brazil.

Holotype ♀, **Brazil**: Guanabara, Represa Rio Grande, i.1972 (*Alvarenga*) (AEI).

Paratypes. **Brazil**: allotype ♂, same data as holotype except xii.1969; Guanabara: 1 ♀, 1 ♂, Represa Rio Grande, iii.1970 (*Alvarenga*) (AEI); 1 ♀, Fioresta da Rijuca, v.1966 (*Alvarenga & Seabra*) (AEI).

Alabagrus parunaupi sp. n.

(Map 5)

Holotype ♀. *Colour.* Yellow with some brown; brown as follows: head except palpi and distal third of antenna; hind coxa distally, hind trochanter, tibia and tarsus, hind femur distally, metasoma after 4th segment; fore wing infuscate with yellowish clear band in distal third quarter (cf. Fig. 17a, but with yellow stigma).

Head. Antenna with 36 flagellomeres; gena right angled posteroventrally (cf. Fig. 2d). *Mesosoma.*

Notauli deeply impressed (cf. Fig. 7d); median longitudinal ridge of scutum present (cf. Fig. 7d); scutellar furrow smooth, lacking longitudinal carinae (cf. Fig. 8a); apex of scutellum (posterior) with acute transverse carina (cf. Fig. 8d); sternaulus weak, mostly smooth with foveae restricted to posteroventral 0·3 of mesopleuron (cf. Fig. 5d); border between metepisternum and metepimeron crenulate (cf. Fig. 5d); metapleuron mostly smooth with several crenulae along ventral margin; propodeum areolate, anterior transverse carina absent (cf. Fig. 9b); mid tibia with 1 preapical spine; hind tibia with 3 apical spines; hind femur weakly rugose ventrally (cf. Fig. 3b), 4·1 × longer than wide. *Metasoma.* 1st tergum with small longitudinal bump anteromedially (cf. Fig. 14c); 1st tergum 1·4 × longer than wide; 2nd plus 3rd tergum 1·2 × longer than wide; 2nd tergum with weak transverse depression indicated (cf. Fig. 14b); 3rd tergum lacking transverse depression (cf. Fig. 14d); ovipositor 0·7 × body length, 2·1 × length of hind femur.

Length. 4·8 mm.

VARIATION ♀. Essentially as in the holotype except as follows: terminal 1 or 2 flagellomeres can be black; anterior transverse carinae of propodeum sometimes present (cf. Fig. 7d).

DISTRIBUTION AND MATERIAL EXAMINED. Map 5. Ecuador and Peru.

Holotype ♀. **Peru**: Cuzco, Quince Mil, 20.–30.x.1962 (SC).

Paratypes. **Ecuador**: 1 ♀, Napo, Limoncocha on Rio Napo (*Drummond*) (FSCA). **Peru**: Huanuco: 1 ♀, same data as holotype; 1 ♀, Tingo Maria, 620 m, 5.–12.x.1964 (*Porter*) (MCZ).

REMARKS. Very similar to *A. aa*, its sister species, but *A. parunaupi* has a distinct transverse ridge on the scutellum while this is weak or lacking in *A. aa*.

Alabagrus parusimi sp. n.

(Fig. 19b, Map 3)

HOLOTYPE ♀. *Colour.* Black and red except yellow as follows: palpi, fore and mid tarsi; metasoma red in basal four-fifths; fore wing clear basally and in large area anteriorly distad stigma, otherwise infuscate (Fig. 19b).

Head. Antenna with 44 flagellomeres; gena acute posteroventrally (cf. Fig. 2e). *Mesosoma.* Notauli deeply impressed (cf. Fig. 7d); median longitudinal ridge of scutum present (cf. Fig. 7d); scutellar furrow smooth, lacking longitudinal carinae (cf. Fig. 8a); apex of scutellum with weak smooth transverse ridge (cf. Fig. 9b); sternaulus foveolate, 0·5 × length of mesopleuron (cf. Fig. 4a); border between metepisternum and metepimeron crenulate (cf. Fig. 5d); metapleuron mostly smooth with crenulae along ventral margin; propodeum smooth (cf. Fig. 10c); mid tibia with 2 preapical spines; hind tibia with 4 or 5 apical spines; hind femur smooth ventrally (cf. Fig. 3e), 4·6 × longer than wide. *Metasoma.* 1st tergum convex (cf. Fig. 14b), 1·2 × longer than wide; 2nd plus 3rd tergum 1·5 × longer than wide; 2nd tergum with weakly impressed transverse depression (cf. Fig. 14b); 3rd tergum lacking transverse depression (cf. Fig. 14d); ovipositor 1·0 × body length, 3·5 × length of hind femur.

Length. 8·0 mm.

VARIATION ♀. As in holotype except propodeum sometimes orange, legs reddish black, propodeum sometimes with weak smooth carinae indicated (cf. Fig. 10e).

DISTRIBUTION AND MATERIAL EXAMINED. Map 3. Trinidad and Guyana.

Holotype ♀, **Trinidad**: Mt Benedict, 5.iii.1954 (*Simmonds*) (CNC).

Paratypes. **Guyana**: 1 ♀, Demerara River, 29.iii.1913 (CU). **Trinidad**: 1 ♀, Santa Cruz Valley, 7.xi.1961 (CNC); 1 ♀, St Augustine, 8.xi.1961 (CNC).

Alabagrus paruyana sp. n.

(Map 11)

HOLOTYPE ♀. *Colour.* Black and yellow; following parts black: head excluding palpi, body of mesosoma except propodeum, fore and mid coxae, trochanter of all legs, basal portions fore and mid femora, hind tibia, and mid and hind tarsus; fore wing banded from base as follows: yellow, infuscate, yellow, infuscate (cf. Fig. 18d).

Head. Antenna with 50 flagellomeres; gena rounded posterolaterally (cf. Fig. 2b). *Mesosoma.* Notauli well impressed (cf. Fig. 7d); scutum anteriorly with weak median longitudinal ridge (cf. Fig. 5f); scutellar furrow smooth, lacking longitudinal carinae (cf. Fig. 8a); apex of scutellum smooth, lacking transverse ridge and rugae (cf. Fig. 8a); median areola of metanotum lacking raised posterior border (Fig. 5b); sternaulus absent; mesopleuron lacking foveae posteroventrally (cf. Fig. 4d but lacking posterior foveae);

border between metepisternum and metepimeron smooth, lacking crenulae (cf. Fig. 4f); metapleuron smooth (cf. Fig. 4f); propodeum smooth (cf. Fig. 10c); carina separating metapleuron from propodeum present only in posterior third; mid tibia with 2 preapical spines; hind tibia with 5 apical spines; hind femur smooth ventrally (cf. Fig. 3e), 3·8 × longer than wide. *Metasoma.* 1st tergum smooth and convex (cf. Fig. 14b), 1·4 × longer than wide; 2nd plus 3rd tergum 1·4 × longer than wide; 2nd tergum with strong transverse depression (cf. Fig. 14d); 3rd tergum with weak transverse depression; ovipositor 1·1 × longer than body, 4·5 × length of hind femur.

Length. 10·0 mm.

Variation ♀. The two paratypes from Eucador are very similar to the holotype. The specimens from Panama have much wider metasomata, slightly shorter ovipositors in relation to total length, and slightly lighter overall coloration, length 7·0–10·8 mm.

Distribution and Material examined. Map 11. Panama and Ecuador, probably widespread in northwestern South America.

Holotype ♀, **Ecuador**: Napo Prov., Coca, v.1965 (*Pena*) (AEI).

Paratypes. **Ecuador**: 2 ♀, same data as holotype. **Panama**: 1 ♀, Canal Zone, Barro Colorado I., 14.vi.1939 (*Zetek*) (USNM); 1 ♀, Barro Colorado I., 17.vii.1924 (*Banks*) (MCZ).

Alabagrus parvifaciatus (Cameron) **comb. n.**

(Figs 1e, 4d, 12b, 12d, Map 13)

Cremnops parvifaciatus Cameron, 1911: 323. Holotype ♂, Guyana (BMNH) [examined].
Cremnops maculipes Cameron, 1911: 322 [not *Agathis maculipes* Cameron, 1887]. Holotype ♀, Guyana (BMNH) [examined]. [Synonymized by Turner, 1918: 82.]
Liyptia rufiventris Enderlein, 1920: 211. Holotype ♀, Ecuador (MZP) [examined]. **Syn. n.**

Holotype ♂. *Colour.* Black, orange and yellow; palpi, fore tarsus and portions of mid tarsus yellow; orange as follows: metapleuron, propodeum, hind coxa except laterally slightly darker, hind femur except apical fifth, and metasoma except apical third; fore wing infuscate; stigma concolorous with remainder of wing (cf. Fig. 16).

Head. Antennae broken (number of flagellomeres about 40); gena expanded posteroventrally but lacking acute angle (cf. Fig. 2f). *Mesosoma.* Notauli well impressed (cf. Fig. 8b); scutum lacking median longitudinal ridge (cf. Fig. 8b); scutellar furrow lacking longitudinal carina (cf. Fig. 8a); apex of scutellum with very weak, smooth, transverse ridge (cf. Fig. 7d); sternaulus weakly impressed, 0·2 × length of mesopleuron, with 1 fovea posteroventrally (cf. Fig. 4d); border between metepisternum and metepimeron crenulate (cf. Fig. 5d); metapleuron smooth except for crenulae on margins; propodeum areolate (cf. Fig. 7d); mid tibia lacking preapical spines; hind tibia with 6 apical spines; hind femur smooth ventrally (cf. Fig. 3e), 3·3 × longer than wide. *Metasoma.* 1st tergum with 2 anterolateral carinae converging but not meeting medially and with weak median longitudinal carina (Fig. 12d); 1st tergum 1·6 × longer than wide; 2nd plus 3rd tergum 1·4 × longer than wide; 2nd tergum with strong transverse depression (Fig. 12d); 3rd tergum lacking transverse depression (cf. Fig. 12c).

Length. 7·2 mm.

Females. Generally as for males except as follows: number of flagellomeres greater, about 45; propodeum smooth with punctures anteromedially (cf. Fig. 10a), carinae only faintly indicated; 1st metasomal tergum about 1·3 × longer than wide with weak, short, anterolateral, longitudinal carinae (Fig. 12b); ovipositor 1·5 × body length, 5·9 × length of hind femur; body generally longer than males, about 10 mm.

Variation ♀ ♂. Metapleuron and propodeum black, orange or bicoloured; metasoma usually black apically, rarely entirely orange (5%) (one group of specimens that I tentively place in this species are entirely pale coloured except for the head); fore wing evenly infuscate (20%) (cf. Fig. 16), or fore wing yellow basally and around stigma (60%) (cf. Fig. 20c) or infuscate with stigmal area yellow (Fig. 17e) (20%) (intermediates are present for all wing patterns above), sternaulus often completely absent except for 1 posteroventral fovea (cf. Fig. 4d); propodea of females usually completely smooth with punctures anteriorly (cf. Fig. 10a), or rarely with very weak indications of major carinae; propodea of males with strong, often irregular areolae (cf. Fig. 10f), with or without rugae in areolae, anterior transverse carina usually absent; mid tibia rarely with 1 preapical spine (3%); carinae of 1st metasomal tergum of females vary in strength from strong and 0·5 tergal length (cf. Fig. 12d), to weak, barely indicated anteriorly (weaker than in Fig. 12b); 1st metasomal tergum of males with 2 or 3 carina, with or without rugae; 1st metasomal tergum from 1·4–1·7 × longer than wide; 2nd plus 3rd metasomal terga up to 1·7 × longer than

wide; transverse depression at midlength of 2nd metasomal tergum usually smooth (85%) (Fig. 12d), rarely rugose (cf. Fig. 12a); length 4·6–10·2 mm.

REMARKS. This species, especially the male, is very similar to *A. stigma*. It differs primarily in that *A. stigma* is usually larger and has much rougher sculpture on the mesosomal pleura, the hind femur and the first two metasomal terga.

HOSTS. *Diatraea albicrinella* Box, *Diatraea andiana* Box, *Diatraea busckella* Dyar & Heinrich, *Diatraea centrella* (Moeschler), *Diatraea impersonatella* (Walker), *Diatraea saccharalis* (F.).

DISTRIBUTION AND MATERIAL EXAMINED. Map 13. Honduras south to Peru and east to Surinam, one anomalous specimen from eastern Brazil.

Holotype ♂, *Cremnops parvifaciatus* Cameron, **Guyana**: 'British Guyana' (BMNH). Holotype ♀, *Cremnops maculipes* Cameron, **Guyana**: 'British Guyana' (BMNH). Holotype ♀, *Lyptia rufiventris* Enderlein, **Ecuador**: Balzapamba (MZP).

Determined specimens of *A. parvifaciatus* are in the following institutions: AEI, BMNH, CNC, CU, FSCA, IML, MCZ, MZP, RNHL, SC, UCV, USNM.

Alabagrus pecki sp. n.

(Map 20)

HOLOTYPE ♀. *Colour*. All yellowish orange except brown or black as follows: head, fore and mid femora, fore and mid tarsi, hind trochanter, hind tarsus and tibia apically; fore wing clear basally, infuscate in distal third (cf. Fig. 19d, but terminal band less sharply defined).

Head. Antenna with 43 flagellomeres; gena weakly expanded posteroventrally, rounded (cf. Fig. 12f). *Mesosoma*. Notauli well impressed (cf. Fig. 8a); scutum with median longitudinal ridge (cf. Fig. 7d); scutellar furrow with weak median carina indicated posteriorly (cf. Fig. 7c); apex of scutellum smooth, lacking transverse ridge and rugae (cf. Fig. 8a); sternaulus reduced to shallow groove lacking foveae, 0·3 × length of mesopleuron; border between metepisternum and metepimeron smooth, lacking longitudinal carinae (cf. Fig. 4f); propodeum mostly smooth with weak, longitudinal carinae (cf. Fig. 10e); mid tibia with 5 preapical spines, hind tibia with 4 apical spines; hind femur smooth ventrally (cf. Fig. 3e), 3·6 × longer than wide. *Metasoma*. 1st tergum 1·3 × longer than wide with large smooth median longitudinal elevation (as in Fig. 13d, but elevation higher and wider with less pronounced lateral margins); 2nd plus 3rd tergum 1·2 × longer than wide; 2nd tergum with transverse depression at mid length (cf. Fig. 14d); 3rd tergum lacking transverse depression (cf. Fig. 14d); ovipositor as long as body, 4·3 × length of hind femur.

Length. 9·2 mm.

ALLOTYPE ♂. As in female holotype except as follows: fore wing with infuscation only slightly stronger apically than basally (cf. Fig. 17c); apex of scutellum with weak, rugose, transverse ridge; border between metepisternum and metepimeron with weak longitudinal carinae; propodeum with lateral longitudinal carina strong and complete.

VARIATION ♀. One of the three paratypes is slightly paler than the holotype, hind trochanter yellowish black instead of dark brown; the paratype from Mexico has some black mottling on anterior 3 metasomal terga, apical band of fore wing from well developed (cf. Fig. 19d) to weakly defined (cf. Fig. 17c); mid tibia with 5 preapical spines, hind tibia with 4–8 apical spines; length 7·1–9·7 mm.

DISTRIBUTION AND MATERIAL EXAMINED. Map 20. Belize, Guatemala and southern Mexico.

Holotype ♀, **Mexico**: Chiapas, Palenque, 2.–30.vi.1983 (*Peck*) (CNC).

Paratypes. **Belize**: 1 ♀, S. Fun Camp, 8.vii.1970 (*Bennett*) (CIBC). **Guatemala**: 1 ♀, Cayuga, vi.1915 (*Schaus*) (USNM). **Mexico**: allotype ♂, Chiapas, San Cristobol de las Casas, 6.vi.1969 (CNC). Chiapas: 1 ♀, Palanque, 100 m, 2.–3.vii.1983 (*Peck*) (AEI); Veracruz: 1 ♀, Catemaco, 1100′ [339 m], 16.–18.vi.1969 (*Mason*) (CNC).

Alabagrus pisipuka sp. n.

(Map 11)

HOLOTYPE ♀. *Colour*. Black and red with fore tarsus yellow; red as follows: distal portions of mid leg, parts of hind leg and metasoma; fore wing deeply infuscate with yellow stigma (cf. Fig. 17e).

Head. Antenna with 50 flagellomeres; gena rounded posteroventrally (cf. Fig. 2b). *Mesosoma*. Notauli weakly impressed (cf. Fig. 8c); scutum lacking median longitudinal ridge (cf. Fig. 8a); scutellar furrow with weak median ridge (cf. Fig. 7c); apex of scutellum with weak, rugose, transverse ridge (cf. Fig. 7b:

sternaulus with foveae extending 0·5 × length of mesopleuron (cf. Fig. 6a); border between metepisternum and metepimeron crenulate (cf. Fig. 5d); margins of metapleuron weakly crenulate (cf. Fig. 5e); propodeum smooth (cf. Fig. 10c); mid tibia with 2 preapical spines; hind tibia with 10 apical spines; hind femur smooth ventrally (cf. Fig. 3e), 4·8 × longer than wide. *Metasoma.* 1st tergum with anteromedial bump (cf. Fig. 15d); 1st tergum 1·8 × longer than wide; 2nd plus 3rd tergum 1·7 × longer than wide; neither 2nd nor 3rd tergum with transverse depression (cf. Fig. 15a); ovipositor about 1·5 × body length, 6·3 × length of hind femur.

Length. 12 mm.

Allotype ♂. As in ♀ holotype except: antenna with 51 flagellomeres; apex of scutellum with weak transverse ridge (cf. Fig. 8b); sternaulus stronger, over 0·5 × length of mesopleuron; propodeum areolate-rugose posteriorly and medially (cf. Fig. 7b); hind tibia with 7 apical spines.

Variation ♂. Sole paratype male is much as in the allotype but it lacks transverse ridge of scutellum; instead only a rugose patch is present, as in the holotype.

Distribution and Material examined. Map 11. Santa Caterina, Brazil.

Holotype ♀, **Brazil**: Santa Catarina, Nova Teutonia, 27°11′S 52°23′W, 9.iv.1951 (*Plaumann*) (BMNH).

Paratypes. **Brazil**: allotype ♂, Santa Catarina, Nova Teutonia, 12.v.1938 (*Plaumann*) (BMNH); 1 ♂, Santa Catarina, Nova Teutonia, 22.iii.1964 (*Plaumann*) (SC).

Alabagrus plaumanni sp. n.

(Map 12)

Holotype ♀. *Colour.* Body dark reddish black except as follows; fore tarsus yellow, head and metasoma anteriorly orange; fore wing infuscate with sharply contrasting yellow stigmal area (cf. Fig. 17e).

Head. Antenna with 46 flagellomeres; carinae of frons weak, especially laterally (cf. Fig. 1d); gena rounded posteroventrally (cf. Fig. 2b). *Mesosoma.* Notauli well impressed (cf. Fig. 8b); scutum with weak median longitudinal ridge (cf. Fig. 7c); scutellar furrow smooth, lacking longitudinal carinae (cf. Fig. 8a); apex of scutellum (posterior) with acute transverse ridge (cf. Fig. 8b); median areola of metanotum not excavated (cf. Fig. 9a) and with median longitudinal ridge; sternaulus weak, indicated posteroventrally by several foveae (cf. Fig. 5e); border between metepisternum and metepimeron crenulate (cf. Fig. 5d); metapleuron smooth (cf. Fig. 5e); propodeum smooth (cf. Fig. 10c); mid tibia with 4 preapical spines; hind tibia with 7 apical spines; hind femur smooth ventrally (cf. Fig. 3e), 5·0 × longer than wide. *Metasoma.* 1st tergum convex (cf. Fig. 14b); 1st tergum 1·3 × longer than wide; 2nd plus 3rd tergum 1·4 × longer than wide; 2nd tergum with weak transverse depression (cf. Fig. 14b); 3rd tergum lacking transverse depression; ovipositor 0·8 × body length, 2·8 × longer than hind femur.

Distribution and Material examined. Map 12. Known only from the type locality in Santa Caterina, Brazil.

Holotype ♀, **Brazil**: Santa Catarina, Nova Teutonia, 27°11′S, 52°23′W, 300–500 m, i.1965 (*Plaumann*) (CNC).

Alabagrus porteri sp. n.

(Map 12)

Holotype ♀. *Colour.* Orange and black; black as follows: head except palpi, propleuron, pronotum anteriorly, metapleuron dorsally, fore coxa and part of fore femur, mid coxa and femur, hind coxa laterally, hind trochanter, hind tibia distally, hind tarsus, and metasoma terminally; fore wing yellow basally, with sharply defined infuscate band in distal quarter (cf. Fig. 19d).

Head. Antenna with 41 flagellomeres, gena acute posteroventrally (cf. Fig. 2c). *Mesosoma.* Notauli deeply impressed (cf. Fig. 9b), scutum with weak median longitudinal ridge (cf. Fig. 9b), scutellar furrow smooth, lacking longitudinal carinae (cf. Fig. 8a); apex of scutellum with weak, smooth, transverse ridge (cf. Fig. 7d); middle areola of metanotum weakly excavated, lacking raised margin posteriorly (cf. Fig. 8c); sternaulus weak, composed of 2 foveae posteroventrally (cf. Fig. 5f); border between metepisternum and metepimeron crenulate (cf. Fig. 5d); metapleuron smooth (cf. Fig. 5d); carina between metapleuron and propodeum lacking in anterior half; propodeum smooth (cf. Fig. 10c); mid tibia with 2 preapical spines; hind tibia with 4 apical spines; hind femur smooth ventrally (cf. Fig. 3e), 3·4 × longer than wide. *Metasoma.* 1st tergum convex (cf. Fig. 14a), 1·3 × longer than wide; 2nd plus 3rd tergum 1·3 × longer than

wide; 2nd tergum with transverse depression (cf. Fig. 14d); 3rd tergum lacking transverse depression (cf. Fig. 14d); ovipositor 0·6 × body length, 2·1 × length of hind femur.

Length. 7·5 mm.

DISTRIBUTION AND MATERIAL EXAMINED. Map 12. Known only from the type locality, Huanuco, Peru.

Holotype ♀, **Peru**: Huanuco, Tingo Maria, 620 m, 5.–12.x.1964 (*Porter*) (MCZ).

Alabagrus puri sp. n.

(Map 5)

HOLOTYPE ♀. *Colour*. Mostly deep reddish brown but also with black, red and yellow; yellow as follows: palpi, fore leg except coxa, mid leg coxa, trochanter and most of femur; head and last few segments of metasoma black; metasoma otherwise red; remainder of body, i.e. most of mesosoma, deep reddish brown; fore wing mostly infuscate with stigmal area yellow and basal area yellowish hyaline (cf. Fig. 20c).

Head. Antenna with about 41 flagellomeres (broken on type); gena greatly expanded posteroventrally, acute (as in Fig. 2a but with sharper angle). *Mesosoma*. Notauli well impressed (cf. Fig. 7d); scutum with well-defined median longitudinal ridge (cf. Fig. 7d); scutellar furrow smooth, lacking longitudinal carinae (cf. Fig. 8a); apex of scutellum with weak, smooth transverse carina (cf. Fig. 7d); sternaulus foveolate, 0·4 × length of mesopleuron, foveae large (cf. Fig. 5c); border between metepisternum and metepimeron crenulate (cf. Fig. 5d); metapleuron with crenulae on ventral margin; propodeum areolate, anterior transverse carina absent (cf. Fig. 9b, but anterior median areola smaller than in figure); mid tibia with 5 preapical spines; hind tibia with 6 apical spines; hind femur smooth ventrally (cf. Fig. 3e), 4·7 × longer than wide. *Metasoma*. 1st tergum with strong anteromedial bump (cf. Fig. 15d, but larger); 1st tergum 1·1 × longer than wide; 2nd plus 3rd tergum 1·4 × longer than wide; 2nd and 3rd terga each with transverse depression (cf. Fig. 13b); transverse depression of 3rd tergum weak; ovipositor 0·5 × body length, 1·9 × length of hind femur.

Length. 8·4 mm.

ALLOTYPE ♂. Differs from holotype as follows: antenna with 43 flagellomeres; 1st tergum of metasoma with stronger anteromedial bump; body length 8·5 mm.

VARIATION ♀ ♂. Mesosomal colour variable, from dark yellowish brown to deep reddish brown; mid legs yellow to brown; sternaulus longer, up to 0·5 × length of mesopleuron; rarely metapleuron rugose in ventral half (cf. Fig. 4a); propodeum rarely more sculptured (cf. Fig. 6e); length 7·5–8·5 mm. The sole ♀ paratype differs from the holotype in lacking a transverse depression on the 3rd metasomal tergum and the 1st tergum is 1·4 × longer than wide. I am not certain that it is a member of this species.

DISTRIBUTION AND MATERIAL EXAMINED. Map. 5. Known only from the type locality in Santa Catarina, Brazil.

Holotype ♀, **Brazil**: Santa Catarina, Nova Teutonia, 27°11′S, 52°23′W, 300–500 m, xi.1966 (*Plaumann*) (BMNH).

Paratypes. **Brazil**: Santa Catarina: allotype ♂, same data as holotype except ii.1965 (BMNH); 1 ♀, 10 ♂, Nova Teutonia, 27°11′S, 52°23′W, 300–500 m, xii.–iii.1947–1967 (*Plaumann*) (AEI, CNC).

Alabagrus roibasi sp. n.

(Map 19)

HOLOTYPE ♀. *Colour*. Black, orange and yellow; palpi, tegula, fore and mid tarsi yellow; orange as follows: mesepimeron, metanotum posteriorly, metapleuron, propodeum, hind coxa, hind femur and basal four-fifths of hind tibia and metasoma; fore wing mostly clear in basal two-thirds, infuscate distally (cf. Fig. 18e).

Head. Antenna with 44 flagellomeres; gena with an obtuse angle posteroventrally (cf. Fig. 2c). *Mesosoma*. Notauli well impressed (cf. Fig. 7d); scutum with median longitudinal ridge (cf. Fig. 7d); scutellar furrow with weak median ridge (cf. Fig. 7d); apex of scutellum with strong transverse ridge (cf. Fig. 9b); sternaulus 0·5 × length of mesopleuron and composed of large foveae (cf. Fig. 4a); border between metepisternum and metepimeron crenulate (cf. Fig. 5d); metapleuron mostly smooth dorsally, rugose in ventral third and with crenulae marginally (cf. Fig. 4a); propodeum areolate, anterior transverse carina absent laterally (cf. Fig. 9b); mid tibia with 2 preapical spines; hind tibia with 11 apical spines; hind femur smooth ventrally (cf. Fig. 3e), 3·3 × longer than wide. *Metasoma*. 1st tergum with small bump medially (cf. Fig. 14b); 1st tergum 1·1 × longer than wide; 2nd plus 3rd tergum 1·1 × longer than wide; 2nd

tergum with transverse depression (cf. Fig. 14d); 3rd tergum lacking transverse depression (cf. Fig. 14d); ovipositor 0·7 × body length; 2·8 × length of hind femur.

Length. 7·8 mm.

ALLOTYPE ♂. As in ♀ holotype except as follows: metasoma with some brown coloration distally and along ventral midline; antenna with 42 flagellomeres; posterior border of median areola of metanotum complete; anterior transverse carina of propodeum complete (cf. Fig. 7d), weak laterally; hind femur 2·7 × longer than wide; length 7·0 mm; in general, shorter, wider and more heavily sculptured than ♀ holotype.

VARIATION ♀ ♂. Metanotum orange to black; metasoma generally entirely orange, sometimes with black markings, palpi yellow to black, hind coxa entirely orange to orange with brown laterally; hind tibia from mostly orange to black; fore wing evenly infuscate (cf. Fig. 16) to mostly clear in basal two-thirds (cf. Fig. 18e); gena can be rounded posteroventrally (cf. Fig. 2b); sternaulus from 0·5–0·8 mesopleural length (cf. Figs 4a, 4c); rugae of metapleuron from restricted to ventral border to covering ventral half (cf. Figs 6a, 4c); anterior carina of propodeum present or absent; hind femur 2·7–3·2 × longer than wide, some males with rugae ventrally (cf. Fig. 3b); length 6·6–8·0 mm; specimens with darker coloration are often more heavily sculptured.

DISTRIBUTION AND MATERIAL EXAMINED. Map 19. Widespread in Mexico south to north-western Costa Rica.

Holotype ♀, **Costa Rica**: Guanacaste, Santa Rosa Park, 22.vi.1978 (*Janzen*) (AEI).

Paratypes. **Costa Rica**: allotype ♂, same data as holotype except 1.vii.1978. 8 ♀, 11 ♂, Guancaste, Santa Rosa Park, v.–xi.1877–78 (*Janzen*) (AEI). **El Salvador**: 1 ♀, 4 km S. Quezaltepeque, 22.vi.1961 (*Irwin*) (USNM); 2 ♀, 4 km N. Quezaltepeque, 27.vi.1961 and 22.vi.1961 (*Irwin*) (USNM). **Mexico**: Chiapas: 1 ♀, Muste, 440 m, nr Huixtla, ix.1970 (*Welling*) (CNC); 1 ♀, El Zapotal, 3·2 km S. Tuxtla Gutierrez, 12.vii.1957 (*Hurd*) (UCB); Coahuila: 1 ♂, 19·2 km N. Hermanas, 11.viii.1959 (*Strange & Menke*) (USNM); Guerrero: 1 ♂, 14 km S. Tierra Colorado, 21.vii.1963 (*Parker & Stange*) (USNM); Jalisco: 1 ♀, Puerto Los Mazos, 14·4 km NW. Autlan, 28.viii.1970 (*Wasbauer*) (UCB); 1 ♀, 40 km N. Guadalajara, 21.viii.1970 (*Wasbauer & Echo*) (UCB); Morelos: 2 ♀, Hujintlan, 22.viii.1956 (*Dreisbach*) (USNM); Oaxaca: 1 ♂, Monte Alban Ruins, 3.viii.1964 (*Daly*) (UCB); San Luis Potosi: 1 ♀, 1 ♂, 9·6 km N. Tamazunchale, 22.viii.1960 (*Howden*) (CNC); 1 ♀, 12 km S. Valles, Ruta 85, 27.–29.vi.1981 (*Miller, Porter & Stange*) (TAMU); 1 ♀, 22·4 km E. Xilitia, 21.vii.1954 (*Dreisbach*) (MSUE); 1 ♂, El Salto Falls, 8.viii.1963 (*Lee*) (FSCA); 2 ♂, El Navanjo, 29.vi.1965 (*Spangler*) (USNM); Tamaulipas: 1 ♂, Mun. de Rancho Nuevo, Burra Coma, 11.–28.vi.1979 (*Gicca*) (FSCA); Veracruz: 1 ♀, Minatitlan, 26.vii.–1.ix.1961 (*Dreisbach*) (MSUE); 1 ♀, Lake Catemaco, 8.–16.viii.1960 (*Howden*) (CNC); 1 ♂, 54 km E. Jalapa, Puente Nac. (MSUE); 1 ♀, Santiago Tuxtla, 8.vii.1956 (*Driesbach*) (MSUE); 1 ♀, Veracruz, x.1962 (*Drauss*) (USNM); 1 ♂, 56 km W. Acayucan, 18.viii.1959 (*Stange & Menke*) (USNM); Yucatan: 1 ♂, Chichen Itza, 19.vii.1962 (*Evans*) (MCZ).

Alabagrus sanctus (Say) comb. n.

(Fig. 10f, Map 16)

Bassus sanctus Say, 1836: 249. NEOTYPE ♀, U.S.A., here designated (USNM).

NEOTYPE ♀. *Colour*. Black and orange; orange as follows: mesepimeron, metapleuron, propodeum, hind coxa, hind femur, hind tibia basally, and metasoma; fore wing infuscate (cf. Fig. 16).

Head. Antenna with 45 flagellomeres; gena rounded posteroventrally (cf. Fig. 2b). *Mesosoma*. Notauli well impressed (cf. Fig. 7b); median logitudinal ridge of scutum very weak (cf. Fig. 9b); scutellar furrow smooth with weak indication of median ridge (cf. Fig. 7c); apex of scutellum with weak irregular transverse ridge (cf. Fig. 7c); sternaulus foveolate, 0·5 × length of mesopleuron (cf. Fig. 5c); border between metepisternum and metepimeron crenulate (cf. Fig. 5d); metapleuron smooth with crenulae on margins (cf. Fig. 5e); propodeum areolate, areolae irregular, median areola divided by longitudinal ridge (cf. Fig. 10f); mid tibia lacking preapical spines; hind tibia with 8 apical spines; hind femur punctate ventrally (intermediate between Figs 3b and 3a), 3·4 × longer than wide. *Metasoma*. 1st tergum with sharply defined median longitudinal carina 0·5 × tergal length (cf. Fig. 13d); 1st tergum 1·1 × longer than wide; 2nd plus 3rd tergum, 1·1 × longer than wide; 2nd tergum with transverse depression (cf. Fig. 14d); 3rd tergum lacking transverse depression (cf. Fig. 14d); ovipositor equal to body length, 4·0 × length of hind femur.

Length. 9·8 mm.

MALE. As in female neotype except sculpture of the following areas usually stronger; posterior transverse ridge of scutellum, propodeum (cf. Fig. 7d), median carina of 1st metasomal tergum (cf. Fig. 13c).

VARIATION ♀ ♂. Coloration quite uniform, rarely propodeum and metapleuron reddish brown; sternaulus often weak; mid tibia with 0–2 preapical spines; median carina of 1st metasomal tergum variable, sometimes absent; ovipositor 1·0–1·1 × body length; body length greatly variable, 5·4–10·9 mm.

REMARKS. The holotype of this species is destroyed as is the bulk of Say's collection of insects (Weiss & Ziegler, 1931). *A. sanctus* is the most common species of *Alabagrus* in the United States after *A. texanus*, and very similar morphologically to both *A. texanus* and *A. imitatus*. I therefore consider it appropriate to designate a neotype to prevent any possible confusion that might arise in the identification of this species. The specimen that I have chosen is from Missouri and agrees with Say's rather generalized description of the species. I have not been able to locate any specimens in good condition from Indiana, the type locality of *A. sanctus*.

A. sanctus is very similar to *A. texanus* but the latter has the hind femur rugose ventrally; that of *A. sanctus* is smooth with light punctation. *A. sanctus* is also very similar to *A. imitatus* but can be distinguished by the following characters: ovipositor 1·1 × body length (1·4–1·5 × in *A. imitatus*); propodeum with irregular rugae or areolae (usually smoother in *A. imitatus*). As noted by Muesbeck (1927), specimens of *A. imitatus* are usually more slender, especially in the metasoma, than those of *A. sanctus*. Males of these two species are very difficult to separate. See the diagnosis and remarks sections under *A. imitatus* for a discussion of this problem.

The type of *Alabagrus sanctus* could have been a specimen of either *A. texanus* or *A. sanctus* as they are understood in this revision. Say's (1836) description of *Bassus sanctus* fits *A. texanus* as well as it does my concept of *A. sanctus*. These are the only two species to which the name could apply.

I am following the traditional concept of *A. sanctus*, e.g., Muesebeck (1927). Muesebeck (1927) gives no reason for applying the name *Bassus sanctus* to this species as opposed to *Alabagrus texanus*, but it is the obvious choice in order to avoid confusion.

DISTRIBUTION AND MATERIAL EXAMINED. Map 16. Widespread in the eastern U.S.A., west to Nebraska, south to southern Texas and north to New York and Michigan.

Neotype ♀, **U.S.A.**: Missouri, Columbia, 7.viii.1967 (*Parker*) (USNM).

Determined specimens are in the following institutions: AMNH, ANSP, CMP, CNC, CU, FSCA, MCZ, MSUE, SC, UGA, USNM, TAMU. Two male specimens, one in UCB, the other in MSUE, appear to be *A. sanctus* on morphological criteria. They were captured in Palomeres, Oaxaca, and Fortin de las Flores, Veracruz. These distributional data make me uncertain of the status of these Mexican specimens which could represent an undescribed species.

Alabagrus semialbus (Szépligeti) **comb. n.**

(Map 5)

Microdus semialbus Szépligeti, 1902: 76. Holotype ♂, BRAZIL (TMB) [examined].

HOLOTYPE ♂. *Colour.* Black, orange, yellow and red-brown; palpi and fore tarsus yellow; otherwise legs all dark except hind coxa medially; head and body of mesosoma black; metasoma black except first segment reddish brown; fore wing infuscate proximally, clear in distal third (cf. Fig. 18a, but lacking pale areas basally).

Head. Antenna with 44–47 flagellomeres (antennae of holotype broken, number based on conspecific specimens); gena greatly expanded posteroventrally, right angled (cf. Fig. 2d). *Mesosoma.* Notauli deeply impressed (cf. Fig. 7d), median longitudinal ridge of scutum present (cf. Fig. 7d); scutellar furrow mostly smooth with weak median longitudinal carinae (cf. Fig. 7d); apex of scutellum with acute, transverse ridge (cf. Fig. 8d); sternaulus composed of 3 or 4 large foveae restricted to posteroventral third of mesopleuron (cf. Fig. 5f, but with more foveae); metapleuron areolate rugose in ventral half (cf. Fig. 4a); propodeum completely areolate (cf. Fig. 7d); mid tibia with 4 preapical spines; hind tibia with 4 apical spines; hind femur rugose ventrally (cf. Fig. 3c), 4·5 × longer than wide. *Metasoma.* 1st tergum convex (cf. Fig. 14b); 1st tergum as long as wide; 2nd plus 3rd tergum 1·2 × longer than wide; 2nd tergum with weak transverse depression (cf. Fig. 14b); 3rd tergum lacking transverse depression (cf. Fig. 14d).

Length. 7·3 mm.

FEMALE. Basically as in ♂ holotype, ovipositor 0·8 × body length, 2·9 × length of hind femur.

VARIATION ♀. ♂. Anterior portion of mesosoma reddish black to black; hind coxa and femur sometimes red; metasomal segments 1–3 sometimes red; mid tibia with 2–4 preapical spines; hind tibia with 3–4 apical spines; body length 6·8–8·7 mm.

DISTRIBUTION AND MATERIAL EXAMINED. Map 5. Known only from Trinidad, Venezuela and Sao Paulo, Brazil, presumably far more widespread.

Holotype ♂, **Brazil**: Sao Paulo (TMB, Type no. 702).

Specimens that I have identified are deposited in the following institutions: AMNH, TMB, UCV.

Alabagrus shorteri sp. n.

(Map 4)

HOLOTYPE ♀. *Colour.* Black and orange; black as follows: head except palpi, body of mesosoma except propodeum, mid and hind coxae, hind femur at midlength; metasoma distad segment 3; fore wing banded from base as follows: yellow, infuscate, yellow, infuscate, bands not sharply defined (cf. Fig. 20a, though not as sharply defined as in figure).

Head. Antenna with ? flagellomeres (antennae broken); gena acute posteroventrally (cf. Fig. 2e). *Mesosoma.* Notauli well impressed (cf. Fig. 7d); scutum with well-defined median longitudunal ridge (cf. Fig. 7d); scutellar furrow smooth, lacking longitudinal carinae (cf. Fig. 8a); apex of scutellum smooth, lacking rugae and distinct ridge (cf. Fig. 8a); sternaulus short, composed of 1 or 2 large foveae posteroventrally (cf. Fig. 5f); border between metepisternum and metepimeron crenulate (cf. Fig. 5d); metapleuron smooth except several weak crenulae on margins; propodeum smooth (cf. Fig. 10c); mid tibia with 4 preapical spines; hind tibia with 5 apical spines; hind femur smooth ventrally (cf. Fig. 3e), 3·8 × longer than wide. *Metasoma.* 1st tergum with long, smooth, median ridge (cf. Fig. 13a); 1st tergum as long as wide; 2nd plus 3rd tergum 1·2 × longer than wide; 2nd and 3rd terga both with distinct transverse depression (cf. Fig. 13b); ovipositor 0·5 × body length, 2·1 × length of hind femur.

Length. 8·5 mm.

DISTRIBUTION AND MATERIAL EXAMINED. Map 4. Known only from the type locality, Cuzco, Peru.

Holotype ♀, **Peru**: Cuzco, Avispas, ix.1962 (SC).

Alabagrus sispacara sp. n.

(Map 3)

HOLOTYPE ♀. *Colour.* Orange except melanic (black and dark brown) as follows: head except mouthparts, all trochanters, hind tibia distally and hind tarsus; fore wing yellowish hyaline basally, infuscate in distal third (cf. Fig. 19f).

Head. Antenna with 36 flagellomeres; gena acute posteroventrally (cf. Fig. 2c). *Mesosoma.* Notauli deeply impressed (cf. Fig. 7d); median longitudinal ridge of scutum well defined (cf. Fig. 7d); scutellar furrow smooth, lacking longitudinal carinae (cf. Fig. 8a); sternaulus represented by several foveae posteroventrally, 0·3 × length of mesopleuron (cf. Fig. 5f); border between metepisternum and metepimeron crenulate (cf. Fig. 5d); metapleuron smooth (cf. Fig. 6d); propodeum areolate, anterior transverse carina lacking; anterior areola with sharply defined borders (cf. Fig. 9d, though anterior areolae not as long as in figure); mid tibia with 3 preapical spines; hind tibia with 3 apical spines; hind femur smooth ventrally (cf. Fig. 3e), 4·6 × longer than wide. *Metasoma.* 1st tergum with weak longitudinal bump anteromedially (cf. Fig. 14a); 1st tergum 1·5 × longer than wide; 2nd plus 3rd tergum 1·3 × longer than wide; neither 2nd nor 3rd tergum with transverse depression (cf. Fig. 15a); ovipositor 0·8 × body length, 2·5 × length of hind femur.

Length. 6·7 mm.

VARIATION ♀. Both paratypes essentially as in holotype ♀.

DISTRIBUTION AND MATERIAL EXAMINED. Map 3. Known only from Peru and Venezuela but is likely to be widespread between the two countries.

Holotype ♀, **Peru**: Huanuco, Tingo Maria, 620 m, 5.–12.x.1964 (*Porter*) (MCZ).

Paratypes. **Peru**: 1 ♀, same data as holotype. **Venezuela**: Aragua: 1 ♀, Rancho Grande, 1000 m, 4.vi.1980 (*Clavijo*) (UCV).

Alabagrus sispalatreillei sp. n.

(Map 19)

HOLOTYPE ♀. *Colour.* Black and reddish orange except palpi and fore tarsus yellow; reddish orange as follows: hind coxa medially, hind femur, basal two-thirds of metasoma; fore wing yellow basally and in large area around stigma, otherwise infuscate (cf. Fig. 20c).

Head. Antenna with 49 flagellomeres; gena acute posteroventrally (cf. Fig. 2e). *Mesosoma.* Notauli deeply impressed (cf. Fig. 7d); median longitudinal ridge of scutum present anteriorly (shorter than in Fig. 7d); scutellar furrow smooth, lacking longitudinal carina (cf. Fig. 8a); apex of scutellum smooth, with weak indication of transverse ridge (cf. Fig. 7d); sternaulus weak and short, about 0·3 × length of mesopleuron (cf. Fig. 5e); border between metepisternum and metepimeron crenulate (cf. Fig. 5d); metapleuron mostly smooth with crenulae on ventral margin; propodeum smooth (cf. Fig. 10c); mid tibia with 3 preapical spines; hind tibia with 4 apical spines; hind femur smooth ventrally (cf. Fig. 3e), 4·0 × longer than wide. *Metasoma.* 1st tergum with weak longitudinal rise (cf. Fig. 14d); 1st tergum 1·1 × longer than wide; 2nd plus 3rd tergum 1·2 × longer than wide; 2nd tergum with transverse depression (cf. Fig. 14d); 3rd tergum lacking transverse depression (cf. Fig. 14d); ovipositor 0·9 × body length, 3·8 × length of hind femur.

Length. 10·2 mm.

VARIATION ♀. Sole paratype essentially as in holotype.

DISTRIBUTION AND MATERIAL EXAMINED. Map 19. Trinidad.

Holotype ♀, **Trinidad**: Curepe, 5.xii.1978, Malaise trap (CNC).

Paratype. **Trinidad**: 1 ♀, St George, St Augustine, 15.vii.–13.viii.1976, Malaise trap (*Noyes*) (BMNH).

Alabagrus solox (Enderlein) **comb. n.**

(Map 7)

Astiria solox Enderlein, 1920: 208. Holotype ♂, BRAZIL (MZP) [examined].

HOLOTYPE ♂. *Colour.* Black and orange except palpi and fore tarsus yellow; orange as follows: hind coxa, femur and tibia, propodeum and metasomal segments 1–4 and part of 5; fore wing clear yellow in basal two-thirds, infuscate distally (cf. Fig. 19a).

Head. Antenna with 44–46 flagellomeres (antennae broken on holotype, number based on paratypes); gena acute posteroventrally (cf. Fig. 2e). *Mesosoma.* Notauli deeply impressed (cf. Fig. 7d); scutum with median longitudinal ridge (cf. Fig. 7d); scutellar furrow smooth, lacking longitudinal carinae (cf. Fig. 8a); apex of scutellum smooth, lacking rugae and distinct transverse ridge (cf. Fig. 8a); median areola of metanotum not well excavated, lacking elevated posterior margin (cf. Fig. 5b); sternaulus foveolate, 0·5 × length of mesopleuron (cf. Fig. 4a); border between metepisternum and metepimeron crenulate (cf. Fig. 5d); metapleuron smooth (cf. Fig. 5d); propodeum smooth (cf. Fig. 10c); carina between propodeum and metapleuron absent anteriorly; mid tibia with 3 preapical spines; hind tibia with 5 apical spines; hind femur smooth ventrally (cf. Fig. 3e), 4·0 × longer than wide. *Metasoma.* 1st tergum convex (cf. Fig. 14a); 1st tergum 1·1 × longer than wide; 2nd plus 3rd tergum 1·4 × longer than wide; 2nd tergum with transverse depression (cf. Fig. 14d); 3rd tergum lacking transverse depression (cf. Fig. 14d).

Length. 8·6 mm.

FEMALE. Essentially as in the ♂ holotype except as follows: 1st metasomal tergum 1·3 × longer than wide; ovipositor 0·6 × body length, 2·3 × longer than hind femur; body length 8·0 mm.

VARIATION ♂. The only other ♂ specimen that I have examined is similar to the holotype except for length, 7·0 mm.

DISTRIBUTION AND MATERIAL EXAMINED. Map 7. South and central Amazon basin.

Holotype ♂, **Brazil**: Para, Obidos, iv.–v.1906 (*Hoffmanns*) (MZP).

Two other specimens are deposited in the CNC.

Alabagrus stigma (Brullé) **comb. n.**

(Figs 3a, 3g, 6b, 8b, 9c, 12a, 20f, Map 1)

Agathis stigma Brullé, 1846: 501. Holotype ♀, BRAZIL (MNHP) [examined].
Microdus stigmaterus Cresson, 1865: 65. Holotype ♀. CUBA (ANSP) [examined]. **Syn. n.**
Microdus diatraeae Turner, 1918: 82. Holotype ♀, GUYANA (BMNH) [examined]. **Syn. n.**
Alabagrus citreistigma Enderlein, 1920: 203. Holotype ♀, BRAZIL (MZP) [examined]. **Syn. n.**
Microdus crossi Brèthes, 1927: 163. Holotype ♀, ARGENTINA (?) [not examined]. **Syn. n.**
Microdus sacchari Myers, 1931: 274. Holotype ♀, GUYANA (BMNH) [examined]. **Syn. n.**

HOLOTYPE ♀. *Colour.* Orange, black and yellow; palpi yellow; head, antenna and fore and mid legs blackish brown; remainder of body reddish orange; fore wing infuscate, stigma yellow with clear patch behind; base of wing weakly infuscate (cf. Fig. 20c).

Head. Antenna with 40 flagellomeres; gena rounded posteroventrally (cf. 2b). *Mesosoma.* Notauli well impressed (Fig. 8b); scutum with weak median longitudinal ridge (cf. 10a); scutellar furrow with several weak longitudinal carinae (Fig. 9c); scutellum heavily punctate, apex lacking transverse ridge (cf. 8a); sternaulus foveolate, almost 0·5 × length of mesopleuron (Fig. 6b); meso- and metapleuron densely punctate (Fig. 6b); propodeum with irregular carina medially (Fig. 8b), posterior areola indicated; propodeum densely punctate anteriorly (Fig. 8b); mid tibia with 3 preapical spine; hind tibia with 1 apical spine; hind femur densely rugopunctate ventrally (Fig. 3a), 3·3 × longer than wide. *Metasoma.* 1st tergum 1·5 × longer than wide, with longitudinal rugosities and with anterolateral converging carinae (Fig. 12a); 2nd tergum with rugose transverse depression (Fig. 12a); 3rd tergum lacking transverse depression; 2nd plus 3rd tergum 1·3 × longer than wide; ovipositor 1·5 × body length, 6·8 × length of hind femur.

Length. 10·1 mm.

Male. Males fall within the range of variation of female *A. stigma*, with four morphological exceptions. First, the first metasomal tergum of one male from Guyana is smooth, except for a pair of anterolateral longitudinal carinae that do not meet medially. Second, all males examined have a deep transverse depression on the third tergum (cf. Fig. 13b), whereas females have a very shallow depression or none at all. Third, the propodea of males are usually (65%) distinctly areolated with rugose sculpture also present (cf. Fig. 10f). Females rarely (20%) have areolation well indicated on the propodeum. Finally, males can be very difficult to distinguish from those of *A. parvifasciatus* as the sculpture of the hind femur can be smooth ventrally in both species (cf. Figs 3b, 3e), though very rarely in *A. stigma*.

I have assembled over 400 specimens of *A. stigma* and have found only ten males. Rarity of the males indicates that the species is largely parthenogenetic (see Hummelen, 1974).

Variation ♀ ♂. Body from orange with black restricted to head, to all legs black, most of mesosoma black except propodeum, metapleuron and usually scutum orange; fore wing from evenly infuscate except for yellow stigma (cf. Fig. 17e), to yellow in basal two-thirds and infuscate apically with dark parastigma (Fig. 20f); mid tibia with 1–4 preapical spines; hind tibia with 7–13 apical spines; pleura of mesosoma and hind legs usually densely punctate, propodeum from almost smooth with rugae restricted medially (cf. Fig. 7b), to rugose (8a), to areolate (cf. Figs 8a, 10f); 1st metasomal tergum usually with longitudinal rugae laterally; transverse depression at midlength of 2nd metasomal tergum smooth to rugose; length 6·8–11·6 mm, usually 10–11 mm.

Hosts. *Diatraea canella* Hudson, *Diatraea impersonatella* Walker, *Diatraea lineolata* Walker, *Diatraea saccharalis* (F.), and *Laphygma frugiperda* (A. & S.).

Remarks. Hummelen (1974) gave a thorough review of the biology of *A. stigma* based on his personal observations. He described the various life stages, searching behaviour, fecundity and sex ratio.

Distribution and Material examined. Map 1. Widespread from southern Florida south to Uruguay and northern Argentina.

A. stigma was introduced into the following areas for the biological control of the sugarcane borer *Diatraea saccharalis* (F.): Antigua, Barbados, Puerto Rico, U.S.A. (Louisiana, Florida).

Holotype ♀, *Agathis stigma* Brullé, **Brazil** Guaratuba (MNHP). Holotype ♀, *Microdus stigmaterus* Cresson, **Cuba** (ANSP, type no. 1738.1). Holotype ♀, *Microdus diatraea* Turner, **Guyana**: Ogle Plantation, east coast of Demerara (BMNH). Holotype ♀, *Alabagrus citreistigma* Enderlein, **Brazil**: Sudbrasilien, Espiritu Santo (MZP). Holotype ♀, *Microdus sacchari* Myers, **Guyana**: Berbice, 9.iv.1929 (BMNH).

Paratypes. *Microdus stigmaterus* Cresson, 2 ♀, **Cuba** (ANSP, paratype nos. 1738.2 and 1738.3).

I could not locate the type of *Microdus crossi* Brèthes. Cushman (1929) synonymized this species with *Agathis stigmaterus* and his notes agree with my opinion on the variability of *A. stigma*. *M. crossi* was reared from the same host as *A. stigma*, and the original description fits well within my concept of *A. stigma*.

Determined specimens of *A. stigma* are in the following institutions: AEI, AMNH, ANSP, BMNH, CNC, CU, FSCA, IML, MCZ, MNMP, NHNV, RNHL, UCV, USNM, ZMHB.

Alabagrus suni sp. n.

(Map 11)

Holotype ♀. *Colour.* Black and orange; following areas orange: fore and mid tarsi, hind coxa and femur, tegula, metapleuron, propodeum, segments 1–4 of metasoma and anterior portions of segments 5 and 6; fore wing banded from base as follows: yellow, infuscate, yellow, infuscate (cf. Fig. 8d).

Head. Antenna with 44 flagellomeres; gena rounded posteroventrally (cf. Fig. 2b). *Mesosoma.* Notauli weakly impressed (cf. Fig. 8c); scutum lacking median longitudinal ridge (cf. Fig. 8c); scutellar furrow

smooth, lacking longitudinal carinae (cf. Fig. 8a); apex of scutellum smooth, lacking rugose ridge (cf. Fig. 8a); median areola of metanotum with weakly raised posterior margin (cf. Fig. 7b); sternaulus weakly impressed, 0·4 × length of mesopleuron, with 1 fovea posteroventrally (cf. Fig. 5d); border between metepisternum and metepimeron with several short longitudinal carinae (cf. Fig. 5d but weaker); metapleuron smooth; propodeum smooth with very weak indication of carinae in posterior half (cf. Fig. 10a); carinae between propodeum and metapleuron complete; mid tibia with 3 preapical spines; hind tibia with 1 apical spines; hind femur smooth ventrally (cf. Fig. 3e), 3·9 × longer than wide. *Metasoma.* 1st tergum slightly raised medially (cf. Fig. 14b), 1·2 × longer than wide, 2nd plus 3rd tergum 1·4 × longer than wide; 2nd tergum with weak transverse depression (cf. Fig. 14d); 3rd tergum lacking transverse depression (cf. Fig. 14d); ovipositor 1·3 × body length, 5·6 × length of hind femur.

Length. 9·4 mm.

VARIATION ♀. Essentially as in the holotype except hind femur melanic in ventral half; median areola of metanotum lacking raised posterior margin (cf. Fig. 8c).

DISTRIBUTION AND MATERIAL EXAMINED. Map 11. Known only from the type locality in southern Peru.

Holotype ♀, **Peru**: Cuzco, Quince Mil, nr Marcapata, 750 m, 10.–15.xi.1966 (*Pena*) (AEI).

Paratype. **Peru**: 1 ♀, Cuzco, Quince Mil, nr Marcapata, 750 m, 20.–30.x.1962 (SC).

Alabagrus testaceus (Szépligeti) comb. n.

(Map 14)

Microdus testaceus Szépligeti, 1902: 76. Holotype ♂, BRAZIL (TMB) [examined].

HOLOTYPE ♂. *Colour.* Yellow with some black; black as follows: head except gena posteroventrally and palpi, patch on hind coxa laterally, portions of hind trochanter and tibia, and hind tarsus; fore wing infuscate except stigmal area yellowish clear and stigma yellowish brown (cf. Fig. 19c).

Head. Antenna with about 38 flagellomeres (broken on holotype, number based on related species); gena acute posteroventrally (cf. Fig. 2e). *Mesosoma.* Notauli well impressed (cf. Fig. 7d); scutum with median, longitudinal ridge (cf. Fig. 7d); apex of scutellum (posterior) with acute transverse ridge (cf. Fig. 8d); sternaulus foveolate, 0·5 × length of mesopleuron (cf. Fig. 4a); border between metepisternum and metepimeron crenulate (cf. Fig. 5d); metapleuron mostly smooth with carinate margins (cf. Fig. 4e); propodeum areolate, anterior median areola long and narrow, much longer than posterior median areola (cf. Fig. 8d); mid tibia with 2 preapical spines; hind tibia with 3 apical spines; hind femur weakly rugose ventrally (cf. Fig. 3b), 4·2 × longer than wide. *Metasoma.* 1st tergum convex (cf. Fig. 14a); 1·5 × longer than wide; 2nd plus 3rd tergum 1·3 × longer than wide; 2nd tergum with weak transverse depression (cf. Fig. 14b); 3rd tergum lacking transverse depression (cf. Fig. 14d).

Length. 6·5 mm.

DISTRIBUTION AND MATERIAL EXAMINED. Map 14. Known only from the type locality in Amazonas, Brazil.

Holotype ♂, **Brazil**: Amazonas, Manaos (TMB, Type no. 705).

Alabagrus texanus (Cresson) comb. n.

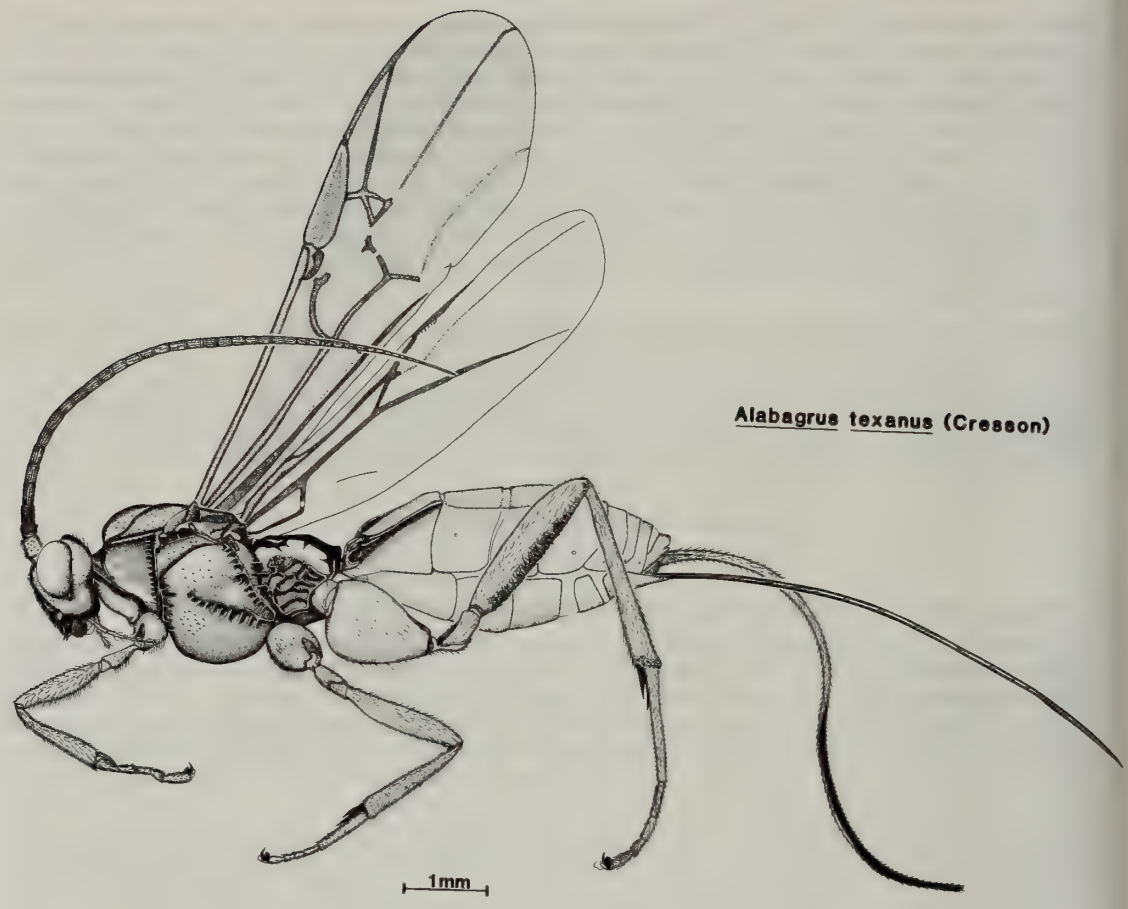
(Figs 2b, 3c, 4c, 12c, 16, Map 15)

Microdus texanus Cresson, 1872: 181. Holotype ♂, U.S.A. (USNM) [examined].

HOLOTYPE ♂. *Colour.* Black, orange, yellow, and brown; palpi, fore and mid tarsi and venter of metasoma yellow; metapleuron and propodeum brown and orange, dorsum of metasoma, hind coxa and femur orange, hind tibia and tarsus brown; remainder of body black; fore wing infuscate (Fig. 16).

Head. Antenna with between 41 and 45 flagellomeres (broken on holotype); gena rounded posteroventrally (Fig. 2b). *Mesosoma.* Notauli well impressed (cf. Fig. 7d); scutum with median longitudinal ridge (cf. Fig. 7d); scutellar furrow with several longitudinal carinae; apex of scutellum with strong irregular transverse ridge (cf. Fig. 7a); sternaulus foveolate, 0·7 × length of mesopleuron (Fig. 4c); border between metepisternum and metepimeron crenulate (cf. Fig. 5d); metapleuron rugose in ventral half and crenulate on margins (Fig. 4c); propodeum areolate, anterior transverse carina complete (Fig. 7d); mid tibia with 4 preapical spines; hind tibia with 6 apical spines; hind femur rugose ventrally (Fig. 3c), 4·1 × longer than wide. *Metasoma.* 1st tergum with weak smooth median longitudinal ridge in anterior half (cf. Fig. 13d); 1st tergum 1·1 × longer than wide; 2nd plus 3rd tergum 1·1 × longer than wide; 2nd tergum with transverse depression (cf. Fig. 14d); 3rd tergum without transverse depression (cf. Fig. 14d).

Length. 7·2 mm.



FEMALES. Generally as in ♂ holotype; females often with weaker sculpture; sternaulus usually 0·5 × length of mesopleuron (cf. Fig. 4a); anterior transverse carina of propodeum often absent or weak; 1st tergum of metasoma usually lacking strong median longitudinal carina, often with small anteromedial rise (cf. Fig. 14d); ovipositor 0·7–0·9 × body length.

VARIATION ♀ ♂. Palpi usually (80%) brown; metapleuron and propodeum from yellow to black, usually (85%) reddish orange; all areas described as yellow, brown or orange on holotype vary from yellow to red; antenna with 41–45 flagellomeres; propodeum well areolate, anterior transverse carina usually present (♂ 95%) (♀ 80%); propodeum often with rugae in areolae, especially in males; 1st tergum of metasoma from smooth with small anteromedial bump (as in most females) (cf. Fig. 14d) to mostly rugose with strong median longitudinal carina and weak transverse rugae (many males) (Fig. 12c); ovipositor 0·7–0·9 × body length; body length 6·5–9·5 mm.

HOSTS. *Microthyris anormalis* (Guenée), *Pachyzanc thesiusalis* Walker, *Pantographa limata* G. and R., *Pilema periusalis* (Walker), *Pilocrocis ramentalis* (Lederer), *Sylepta silicalis* (Guenée), *Syngamia haemorrhoidalis* (Guenée).

REMARKS. Needham (1955) has elucidated some aspects of the natural history of this species.

DISTRIBUTION AND MATERIAL EXAMINED. Map 15. Eastern U.S.A., west to Nebraska, north to the southern tip of Ontario, and south to the Florida Keys and southern Texas.

Holotype ♂, **U.S.A.**: Texas (USNM, type no. 1723).

Determined specimens are deposited in the following institutions: AMNH, ANSP, BMNH, CNC, CU, FSCA, LFAC, MCZ, MSUE, RNHL, SC, TAMU, UCB, UGA, USNM.

One specimen of *A. texanus* from the Ashmead collection (USNM) is recorded from 'British Columbia' (Canada?); I presume that it has been mislabelled.

Alabagrus triangulifer (Enderlein) comb. n.

(Fig. 10d, Map 11)

Liptia triangulifera Enderlein, 1920: 211. Holotype ♀, Brazil (MZP) [examined].

Holotype ♀. *Colour.* Mostly red, partly black, brown and yellow; fore and mid legs yellow except coxae brown; palpi yellow; head black except antennal flagellomeres yellowish orange, ventral portion of mesepisternum black; fore wing infuscate with yellow stigmal area and becoming yellow towards wing base; parastigma black (cf. Fig. 20c).

Head. Antenna with about 48–51 flagellomeres (antennae broken on holotype); gena rounded posteroventrally (cf. Fig. 2b). *Mesosoma.* Notauli weakly impressed (cf. Fig. 8c), scutum with weak median longitudinal ridge (cf. Fig. 7c); scutellar furrow with several weak longitudinal carinae; apex of scutellum with weak transverse ridge (cf. Fig. 7b); sternaulus weak, represented by 1 fovea posteroventrally (cf. Fig. 5d); border between metepisternum and metepimeron crenulate (cf. Fig. 5d); metapleuron mostly smooth with several carinae anteriorly and along margins (cf. Fig. 4e); propodeum with anterior and posterior median areolae and posterior transverse carina (Fig. 10d); mid tibia with 3 preapical spines; hind tibia with 9 apical spines; hind femur smooth ventrally (cf. Fig. 3e), 3·6 × longer than wide. *Metasoma.* 1st tergum with large longitudinal bump (cf. Fig. 14a but larger); 1st tergum 1·6 × longer than wide; 2nd plus 3rd tergum 1·6 × longer than wide; 2nd tergum with weak transverse depression (cf. Fig. 14b), posterior portion of 2nd tergum considerably higher than anterior portion; 3rd tergum lacking transverse depression (cf. Fig. 14d).

Length. 10·7 mm.

Females. As in male holotype except as follows: propodeum usually smoother, carinae usually (80%) absent (cf. Fig. 10a) and weak when present (cf. Fig. 7c); longitudinal ridge on scutum and transverse ridge on scutellum usually absent (cf. Figs 8c, 8a); ovipositor usually longer than body but quite variable, 0·8–1·3 × body length, 5·0–7·2 × length of hind femur.

Variation ♀ ♂. The variation in this species is striking; sculpture, coloration and ovipositor length all vary significantly. Extremes of variation are as follows: entire antenna yellowish orange; most of mesosoma black except fore and mid legs always yellow; fore wing infuscate basally (cf. Fig. 17e); rarely notauli well impressed; sternaulus from well impressed and 0·5 × length of mesopleuron to absent except for 1 fovea posteroventrally; posterior transverse ridge of scutellum very weak and smooth (cf. Fig. 7d); propodeum from completely smooth to well areolated, especially in males (cf. Figs 10a, 10d); 1st metasomal tergum often with anteromedial bump weak or absent (cf. Fig. 14b); ovipositor 5·0–7·2 × length of hind femur; ♀ length 8·9–12·3 mm, ♂ length 9·2–10·9 mm.

Distribution and Material examined. Map 11. South-eastern Brazil west to western Paraguay.

Holotype ♂, **Brazil**: Santa Catarina, Luderwaldt (MZP).

Specimens that I have determined are in the following institutions: AEI, BMNH, CNC, MCZ and SC.

Alabagrus tricarinatus (Cameron) comb. n.

(Figs 3b, 18c, Map 6)

Agathis tricarinata Cameron, 1905: 385. Holotype ♀, Brazil (BMNH) [examined].

Holotype ♀. *Colour.* Dark brown to black except as follows: palpi and fore tarsus yellow, propodeum orange, metasomal segments 1 and 2 and part of 3 orange; fore wing infuscate except clear band in distal third quarter (Fig. 18c).

Head. Antenna with 38–41 flagellomeres (antennae broken, number based on conspecific specimens); gena greatly expanded posteroventrally, right angled (similar to Fig. 2a but without sharp angle). *Mesosoma.* Notauli deeply impressed (cf. Fig. 7d), median longitudinal ridge of scutum present (cf. Fig. 7d); scutellar furrow smooth, lacking longitudinal carinae (cf. Fig. 8a); apex of scutellum with weak, irregular, transverse ridge (cf. Fig. 7c); sternaulus composed of 4 large foveae restricted to posteroventral half of mesopleuron (cf. Fig. 5c); border between metepisternum and metepimeron crenulate (cf. Fig. 5d); metapleuron smooth except for several crenulae along margins (cf. Fig. 5c); propodeum areolate (slightly stronger than in Fig. 10e), lacking anterior transverse carina; mid tibia with 3 preapical spines; hind tibia with 5 apical spines; hind femur smooth to weakly rugose ventrally (Fig. 3b), 4·2 × longer than wide. *Metasoma.* 1st tergum convex (cf. Fig. 14b); 1st tergum 1·2 × longer than wide; 2nd plus 3rd tergum 1·3 × longer than wide; 2nd tergum with weak transverse depression (cf. Fig. 14b); 3rd tergum lacking transverse depression (cf. Fig. 14b); ovipositor 0·9 × body length; 3·2 × length of hind femur.

Length. 6·2 mm.

MALE. Usually smaller than female, colour lighter, sculpture stronger.

VARIATION ♀ ♂. Legs often with more yellow; fore and hind coxae partly yellow; all tarsi yellow; mesosoma entirely dark brown or black; clear area of wing can form band or large spot posterodistally; posterior transverse ridge of scutellum smooth to weakly rugose (cf. Figs 7c, 7d); body length 6·2–8·1 mm.

DISTRIBUTION AND MATERIAL EXAMINED. Map 6. Widespread, from northern Costa Rica south to northern Argentina.

Holotype ♀, **Brazil**: Amazonas, Rio Mauhes [= Rio Maués] (BMNH).

Specimens that I have identified are deposited in the following institutions: AEI, AMNH, BMNH, CNC, FSCA, MCZ, SC, UCV, ZMHB.

Alabagrus tripartitus (Brullé) **comb. n.**

(Figs 1a, 6d, 6e, 11b, 18a, 18b, Map 2)

Agathis tripartita Brullé, 1846: 496. Holotype ♀, GUYANA (MIZT) [examined].

HOLOTYPE ♀. *Colour.* Black and orange; orange as follows: palpi, metapleuron and propodeum, fore tarsus, hind coxa basally, hind femur distally, anterior two-thirds of metasoma; hind tibia blackish orange; 2nd and 3rd metasomal terga with some black mottling; fore wing banded from base as follows: clear, infuscate, clear, infuscate (cf. Fig. 20a).

Head. Antenna with 44 flagellomeres; gena acute posteroventrally (cf. Fig. 2e). *Mesosoma.* Notauli deeply impressed (cf. Fig. 4a); scutum with median longitudinal ridge (cf. Fig. 4a); scutellar furrow with weak median carinae (cf. Fig. 4a); apex of scutellum smooth, lacking rugae and transverse ridge (cf. Fig. 8a); sternaulus deeply impressed, represented by 3 or 4 large foveae posteroventrally (Fig. 6d); border between metepisternum and metepimeron crenulate (cf. Fig. 5d); metapleuron smooth (Fig. 6d); propodeum areolate, anterior median areola small, lateral longitudinal carina absent behind posterior transverse carina (Fig. 6e); mid tibia with 5 preapical spines, hind tibia with 11 apical spines; hind femur punctate ventrally (intermediate between Figs 3a and 3b), 4·0 × longer than wide. *Metasoma.* 1st tergum with long, strong, median carina (Fig. 11b); 1st tergum as long as wide; 2nd plus 3rd tergum 1·1 × longer than wide; 2nd tergum with transverse depression (cf. Fig. 13b); 3rd tergum with weak transverse depression (cf. Fig. 13b); ovipositor 0·8 × body length, 3·1 × length of hind femur.

MALE. Males do not differ significantly from females.

VARIATION ♀ ♂. Colour varies from almost completely black with exception of fore tarsus yellow and 1st metasomal tergum orange, to pale with even more orange than holotype, i.e., hind coxa all orange, 2nd plus 3rd metasomal tergum orange; fore wing usually as in holotype, sometimes bands weak (Fig. 18b); rarely fore wing entirely infuscate except clear distally (Fig. 18a); propodeum usually with anterior transverse carina weak; propodeum rarely with lateral longitudinal carina weak posteriorly (cf. Fig. 10b); body length 7·3–9·2 mm.

DISTRIBUTION AND MATERIAL EXAMINED. Map 2. Widespread in northern South America from Peru, the Caribbean countries and south to Para, Brazil; one specimen was collected in Tabasco, Mexico.

Holotype ♀, **Guyana**: La Mana, date ? (*Serville*) (MIZT).

Specimens that I have determined are deposited in the following institutions: BMNH, CIBC, CNC, CU, RNHL, SC, UCV, USNM, ZMHB.

Alabagrus tupinamba **sp. n.**

(Map 5)

HOLOTYPE ♀. *Colour.* Black, yellow, orange and red; yellow as follows: palpi, fore and mid legs, hind trochanter, tegula; orange as follows: scutum laterally, propodeum; red as follows: metasoma except terminally, hind leg except coxa and trochanter; remainder of body black; fore wing banded from base as follows: yellow, infuscate, yellow, infuscate (cf. Fig. 18d).

Head. Antenna with 46 flagellomeres; gena acute posteroventrally (cf. Fig. 2e). *Mesosoma.* Notauli deeply impressed (cf. Fig. 9b); median longitudinal ridge of scutum weak (cf. Fig. 9b); scutellar furrow smooth, lacking longitudinal carinae (cf. Fig. 8a); apex of scutellum smooth, lacking transverse ridge (cf. Fig. 8a); sternaulus foveolate, about 0·5 × length of mesopleuron (cf. Fig. 5c); border between metepisternum and metepimeron crenulate (cf. Fig. 5d); metapleuron mostly smooth with crenulae on ventral margin (cf. Fig. 4e); propodeum smooth (cf. Fig. 10c); mid tibia with 6 preapical spines; hind tibia

with 4 apical spines; hind femur smooth ventrally, 5·4 × longer than wide. *Metasoma.* 1st tergum with smooth, longitudinal rise medially (cf. Fig. 14a); 1st tergum 1·7 × longer than wide; 2nd plus 3rd tergum 1·9 × longer than wide; both 2nd and 3rd tergum with transverse depression (cf. Fig. 13b); ovipositor 0·8 × as long as body; 3·3 × longer than hind femur.

Length. 11·0 mm.

VARIATION ♀. Often no red coloration on scutum; all red areas as described in holotype can be yellow or orange; distal pale band on fore wing sometimes (20%) reduced posteriorly (cf. Fig. 20c); sternaulus reduced (cf. Fig. 5e); preapical spines of mid tibia as few as 3.

DISTRIBUTION AND MATERIAL EXAMINED. Map 5. Northern Peru south to Bolivia and east to Guanabara, Brazil.

Holotype ♀, **Brazil**: Guanabara, Represa do Rio Grande, vi.1966 (*Alvarenga*) (AEI).

Paratypes. **Bolivia**: Beni: 1 ♀, Versalles, 19.vii.1964 (*Bouseman & Lussenhop*) (AMNH). **Brazil**: Guanabara: 2 ♀, same data as holotype; 2 ♀, Represa Rio Grande, viii.1966 (*Alvarenga*) (AEI); 1 ♀, same data as above except, vii.1966. **Peru**: Huanuco: 1 ♀, Yanayacu, Rio Pachitea, 17.viii.1961 (*Shunke*) (BMNH); Loreto: 1 ♀, Boqueron Abad, 13.ix.1962 (*Schunke*) (BMNH); Ucayali: 2 ♀, Pucallpa, 27.v.1961 and 15.xi.1962 (*Shunke*) (BMNH).

Alabagrus uchuk sp. n.

(Figs 1d, 6c, 8a, 10e, 15a, 15b, 17d, Map 12)

HOLOTYPE ♀. *Colour.* Yellow with some brownish black as follows: head, hind trochanter, hind femur distally and hind tibia on proximal and distal ends; hind tarsus yellowish brown; fore wing infuscate, paler behind stigma (Fig. 17d).

Head. Antenna with 34 flagellomeres; lateral carina of frons reduced (cf. Fig. 1d); gena rounded posteroventrally (cf. Fig. 2b). *Mesosoma.* Notauli well impressed (Fig. 8a); scutum lacking median longitudinal ridge (Fig. 8a); scutellar furrow smooth, lacking longitudinal carinae (Fig. 8a); apex of scutellum with weak, smooth transverse ridge weakly indicated (cf. Fig. 8c); sternaulus represented by several foveae posteroventrally (Fig. 6c); metapleuron smooth except for short ridges on border between metepisternum and metepimeron and very weak crenulae on margins (Fig. 6c); propodeum mostly smooth, with lateral longitudinal carinae weakly indicated (Fig. 10e); mid tibia with 2 preapical spines; hind tibia with 5 apical spines; hind femur smooth ventrally (cf. Fig. 3e), 4·3 × longer than wide. *Metasoma.* 1st tergum convex (cf. Fig. 14b); 1st tergum 1·8 × longer than wide; 2nd plus 3rd tergum 1·3 × longer than wide; neither 2nd nor 3rd tergum with distinct transverse depression (Fig. 15a); ovipositor equal to body length, 3·8 × length of hind femur.

Length. 5·4 mm.

ALLOTYPE ♂. As in ♀ holotype except as follows: terminal segments of metasoma yellowish brown; posterior transverse ridge of scutellum well developed, rugose; propodeum well areolated, all major carinae present (cf. Fig. 7d); body length 4·9 mm.

VARIATION ♀ ♂. Coloration varies from yellow to dull yellowish orange; fore wing rarely (15%) with stigma yellow and stigmal area clear (cf. Fig. 17e); males with much heavier sculpture than females; males usually with brown coloration on metasoma; females usually with metasoma completely yellow (though one specimen from Surinam has the metasoma mostly melanic); transverse scutellar ridge can be absent (Fig. 8a); length 3·8–5·6 mm.

DISTRIBUTION AND MATERIAL EXAMINED. Map 12. Widespread and common in north-western South America from southern Peru through the Amazon Basin to French Guiana.

Holotype ♀, **Ecuador**: Napo Prov., Limoncocha, 250 m, 15.–18.vi.1976 (*Peck*) (CNC).

Paratypes. **Bolivia**: state? 1 ♀ (*Staudinger*) (ASBS). **Brazil**: Amazonas: 1 ♀, Manaos, vii.1935 (*Van Vredenburg*) (BMNH); Para: 1 ♀, Belem, x.1961 (*Bennett*) (CIBC); 1 ♀, same data (BMNH). **Guyana**: 2 ♀, Demerara River, 20.–24.iii.1913 (CU); 1 ♀, Bartica, 18.ii.1913 (SC). **Ecuador**: allotype ♂, same data as holotype; Esmereldas: 1 ♀, Dureno, 200 m, 23.–28.ix.1977 (*Pena*) (CNC); Napo: 50 ♀, 56 ♂, same data as holotype; 10 ♀, Limoncocha, vi., vii.1974 (*Drummond*) (FSCA); 1 ♀, Limonchocha, 29.iii.1974 (*Drummond*) (FSCA); 1 ♀, 2 ♂, Limonchocha (*Spangler & Givens*) (USNM). **Peru**: Cuzco: 1 ♀, Quince Mil, 750 m, nr Marcapata, ix.1962 (*Pena*) (AEI); 1 ♀, Quince Mil, ix.1962 (SC). **Surinam**: 1 ♀, Moengo, 10.ii.1947 (*Geijskes*) (RNHL). **Trinidad**: 1 ♀, Arima Valley (*Rozen & Wygodzinsky*) (AMNH); 1 ♀, Maracas, xii.1977 (*Mason*) (MC); 3 ♀, Morne Bleu, 2,700′ (830 m), viii.1969 (*Howden*) (CNC, AEI). **Venezuela**: Bolivar: 2 ♀, El Bochinche Res., Forestal Imataca, 200 m, 6.–13.xii.1974 (UCV).

Alabagrus uchukqepi sp. n.

(Map 11)

HOLOTYPE ♀. *Colour.* Black and yellow; head including antenna black; mesosoma black except tegula and propodeum yellow; legs yellow except all coxae black and hind leg dark apically; metasoma yellow except black apically; fore wing yellow with infuscate terminal band and narrow infuscate band proximad stigma (similar to Fig. 18d but with smaller basal dark band); hind wing yellow basally and along anterior margin, infuscate posteroapically.

Head. Antenna with 54 flagellomeres; gena rounded posteroventrally (cf. Fig. 2b); face laterad clypeus with weak, blunt ridge; occiput deeply excavated medially; inner angle of occipital excavation sharp (cf. Fig. 1b). *Mesosoma.* Notauli weakly impressed (cf. Fig. 8c); scutum lacking median longitudinal ridge (cf. Fig. 8c); scutellar furrow smooth, lacking longitudinal carinae (cf. Fig. 8a); apex of scutellum smooth, lacking transverse ridge (cf. Fig. 8a); sternaulus composed of several small foveae posteroventrally (cf. Fig. 5e); border between metepimeron and metepisternum mostly smooth with one short longitudinal ridge; metapleuron smooth (cf. Fig. 5d); carinae between propodeum and metapleuron weak, rounded; propodeum smooth (cf. Fig. 10c); mid tibia lacking preapical spines; hind tibia with 5 apical spines; hind femur smooth ventrally (cf. Fig. 3e), 4·0 × longer than wide. *Metasoma.* 1st tergum smooth, convex (cf. Fig. 14b); 1st tergum 1·5 × longer than wide; 2nd plus 3rd tergum 1·2 × longer than wide; 2nd tergum with transverse depression (cf. Fig. 14d); 3rd tergum lacking transverse depression (cf. Fig. 14d); ovipositor 1·1 × body length, 5·0 × length of hind femur.

Length. 12·0 mm.

REMARKS. This species is similar to *A. varia* Enderlein; they differ mostly in body colour, hind wing colour pattern and degree of development of the ridges laterad the clypeus. These ridges are considerably smaller in the female of *A. uchukqepi* and it is primarily on the basis of this character that I believe that the specimen represents a distinct species.

DISTRIBUTION AND MATERIAL EXAMINED. Map 11. Known only from the type locality in Surinam.

Holotype ♀, **Surinam**: Upper Corantijn, Coeroeni I., 27.viii.1959 (*Geijskes*) (RNHL).

Alabagrus uru sp. n.

(Map 3)

HOLOTYPE ♀. *Colour.* Black and orange except yellow as follows: palpi, fore coxa posteriorly, fore tarsus, mid tarsus partly and tegula; orange as follows: hind femur medially, basal half of metasoma; propodeum orange-black; fore wing infuscate except for clear band past mid length (cf. Fig. 18c).

Head. Antenna with ? flagellomeres (antennae broken); gena right angled posteroventrally (cf. Fig. 2d). *Mesosoma.* Notauli deeply impressed (cf. Fig. 7d); median longitudinal ridge of scutum present (cf. Fig. 7d); scutellar groove smooth, lacking longitudinal carinae; apex of scutellum with weak irregular transverse ridge (cf. Fig. 7b); sternaulus foveolate, 0·5 × length of mesopleuron (cf. Fig. 4a); border between metepisternum and metepimeron crenulate (cf. Fig. 5d); smooth with weak outline of lateral longitudinal and posterior transverse carinae (cf. Fig. 10e); mid tibia with 2 preapical spines; hind tibia with 4 apical spines; hind femur smooth ventrally (cf. Fig. 3e), 4·5 × longer than wide. *Metasoma.* 1st tergum with weak bump anteromedially (cf. Fig. 14b); 1st tergum 1·3 × longer than wide; 2nd plus 3rd tergum 1·4 × longer than wide; 2nd tergum with weak transverse depression (cf. Fig. 14d); 3rd tergum lacking transverse depression (cf. Fig. 14d); ovipositor 1·0 × body length, 3·8 × length of hind femur.

Length. 6·7 mm.

VARIATION ♀. As in holotype except as follows: tegula brownish black, propodeum orange, hind femur melanic except for distal third.

DISTRIBUTION AND MATERIAL EXAMINED. Map 3. Peru.

Holotype ♀, **Peru**: Cuzco, Avispas, nr Marcapata, 30 m, 20.–30.x.1963 (*Pena*) (AEI).

Paratype. **Peru**: Huanuco: 1 ♀, Pachitea River (*Staudinger*) (ZMHB).

Alabagrus variegatus (Brullé) comb. n.

(Map 7)

Agathis variegata Brullé 1846: 504. Holotype ♀, FRENCH GUIANA (MNHP) [examined].
Agathis ischioxantha Brullé, 1846: 503–504. Holotype ♂, FRENCH GUIANA (MNHP) [examined]. **Syn. n.**
Alababrus laeviventris Enderlein, 1920: 204. Holotype ♀, BRAZIL (MZP) [examined]. **Syn. n.**

HOLOTYPE ♀. *Colour.* Orange and black except palpi, fore and mid tarsi all yellow; black as follows: head, lateral lobes of scutum, scutellum posteriorly, propleuron, pronotum and metanotum in ventral half, fore trochanter, femur and tibia; mid leg except tarsus, hind trochanter; hind tibia and tarsus blackish orange; antennal flagellomeres somewhat paler than scape; fore wing infuscate with yellow stigmal area; fore wing somewhat lighter basally than apically (cf. Fig. 19c).

Head. Antenna with about 36 flagellomeres (antennae broken on holotype), gena greatly expanded posteroventrally, right angled (as in Fig. 2a but with right angle). *Mesosoma.* Notauli deeply impressed (cf. Fig. 7d); scutum with median longitudinal ridge (cf. Fig. 7d); scutellar furrow with weak median longitudinal carina; apex of scutellum smooth, lacking rugae and transverse ridge (cf. Fig. 8a); median areola of metanotum not deeply excavated, posterior margin not elevated (cf. Fig. 9a); sternaulus foveolate, 0·5 × length of mesopleuron (cf. Fig. 4a); border between metepisternum and metepimeron crenulate (cf. Fig. 5d); metapleuron mostly smooth with crenulae along margins (cf. Fig. 5c); propodeum areolate, lacking anterior transverse carina (cf. Fig. 9b); mid tibia with 2 preapical spines; hind tibia with 3 apical spines; hind femur smooth ventrally (cf. Fig. 3e), 4·0 × longer than wide. *Metasoma.* 1st tergum with small anteromedial bump (cf. Fig. 14a); 1st tergum 1·4 × longer than wide, 2nd plus 3rd tergum 1·5 × longer than wide; 2nd tergum with transverse depression (cf. Fig. 14d); 3rd tergum lacking transverse depression (cf. Fig. 14d); ovipositor 0·7 × body length; 2·6 × length of hind femur.

MALE. Essentially as in female holotype except as follows: mesosoma mostly melanic; all black except metapleuron and propodeum orange; hind coxa orange, remainder of hind leg blackish orange; propodeum completely areolate (cf. Fig. 7d), i.e., with anterior transverse carinae complete; 1st metasomal tergum 1·2 × longer than wide.

VARIATION. Little variation other than fore wing rarely (5%) infuscate basally (cf. 17e).

DISTRIBUTION AND MATERIAL EXAMINED. Map 7. South-eastern Brazil south to Buenos Aires, Argentina and west to southern Bolivia.

Holotype ♀, *Agathis variegata* Brullé, **French Guiana**: La Mana (*Leschenault & Doumerc*) (MNHP). Holotype ♂, *Agathis ischioxantha* Brullé, **French Guiana**: La Mana (*Leschenault & Doumere*) (MNHP). Holotype ♀, *Alabagrus laeviventris* Enderlein, **Brazil**: Santa Catarina (*Luderwaldt*) (MZP).

Specimens that I have determined are in the following institutions: AEI, BMNH, CNC, CU, MCZ, NHMV, TBM.

Alabagrus varipes (Cresson) comb. n.

(Fig. 5a, Map 10)

Microdus varipes Cresson, 1865: 65. Holotype ♀, CUBA (ANSP) [examined].
Agathis varicubensis Shenefelt, 1970: 365. [Unnecessary replacement name.]

HOLOTYPE ♀. *Colour.* Orange except brown as follows: antenna, mouth parts, fore and mid legs excluding coxae and tarsi; hind trochanter, tibia and tarsus; fore and mid tarsi yellow; fore wing deeply infuscate (cf. Fig. 16).

Head. Antenna with 41–46 flagellomeres (antennae broken on holotype, numbers based on conspecific specimens), gena rounded posteroventrally (cf. Fig. 2b). *Mesosoma.* Notauli well impressed (cf. Fig. 7d); scutum with median longitudinal ridge (cf. Fig. 7d); scutellar furrow with median longitudinal ridge (cf. Fig. 7d); apex of scutellum with well-developed, irregular, transverse ridge (cf. Fig. 7a); sternaulus foveolate, 0·5 × length of mesopleuron (Fig. 5a, or cf. Fig. 5c); posterior margin of epicnemium large and curled behind fore coxa (Fig. 5a); border between metepisternum and metepimeron crenulate (cf. Fig. 5d); metapleuron mostly smooth except for few crenulae along ventral margin; propodeum areolate, anterior transverse carina absent (cf. Fig. 9b); anterior median areola larger than posterior median areola; mid tibia with 4 preapical spines; hind tibia with 10 apical spines; hind femur smooth ventrally (cf. Fig. 3e), 3·3 × longer than wide. *Metasoma.* 1st tergum with small bump anteromedially (cf. Fig. 14b); 1st tergum 1·1 × longer than wide; 2nd plus 3rd tergum 1·1 × longer than wide; 2nd tergum with transverse depression (cf. Fig. 14d); 3rd tergum lacking transverse depression (cf. Fig. 14d).

Length. 7·8 mm.

FEMALE. As in ♂ holotype except as follows: ovipositor 0·9 × body length, 3·7 × length of hind femur.

VARIATION ♀ ♂. Black as follows: head, propodeum, fore and mid coxa, tegula; epicnemium ventrally and fore coxa posteriorly both yellow; sternaulus with foveae reduced; anterior transverse carina of propodeum rarely (5%) present (cf. Fig. 7d); hind tibia with 6–10 apical spines; body length 5·8–7·8 mm.

Distribution and Material examined. Map 10. Greater Antilles.

Holotype ♂, **Cuba** (ANSP type # 1737).

Specimens that I have determined are in the following institutions: AMNH, ANSP, BMNH, CNC, FSCA, MCZ, USNM, TAMU.

Remarks. Shenefelt (1970) established an unnecessary replacement name for *Agathis varipes* (Cresson, 1865), because he believed it to be preoccupied by *Agathis varipes* Thompson, 1895. In fact, *varipes* Cresson is the senior homonym although it was first described under *Microdus*. As *varipes* Cresson is here transferred to *Alabagrus* a replacement name for *varipes* Thompson is unnecessary as it remains in *Agathis*.

Alabagrus varius (Enderlein) **comb. n.**

(Map 20)

Astiria varia Enderlein, 1920: 207. Holotype ♀ Mexico (MZP) [examined]

Holotype ♀. *Colour.* Black and yellow; yellow as follows: propleuron, pronotum, scutum, tegula, metapleuron, propodeum, 1st and 2nd metasomal terga, fore leg except basal four-fifths of femur, mid leg except coxa and basal four-fifths of femur, hind femur in apical two-thirds and hind trochanter; fore wing with 4 bands from base to apex as follows: yellow, infuscate, yellow, infuscate (cf. Fig. 20a); hind wing with infuscate band at mid length.

Head. Antenna with 49 flagellomeres; gena rounded posteroventrally (cf. Fig. 2b); face laterad clypeus with weak blunt ridge; occiput deeply excavated medially, inner angle of occipital excavation sharp (cf. Fig. 1b). *Mesosoma.* Notauli weakly impressed (cf. Fig. 8c); scutum lacking median longitudinal ridge (cf. Fig. 8c); scutellar furrow smooth, lacking longitudinal carinae (cf. Fig. 8a); apex of scutellum smooth, lacking transverse ridge (cf. Fig. 8a); sternaulus composed of several small foveae posteroventrally (cf. Fig. 5e); border between meso- and metepimeron smooth, lacking crenulae (cf. Fig. 5d); metapleuron smooth, carina between propodeum and metapleuron weak, rounded; propodeum smooth (cf. Fig. 10c); mid tibia lacking preapical spines; hind tibia with 5 apical spines; hind femur smooth ventrally (cf. Fig. 3e), 4·0 × longer than wide. *Metasoma.* 1st tergum smooth, convex (cf. Fig. 14b); 1st tergum 1·2 × longer than wide; 2nd tergum with distinct transverse depression (cf. Fig. 14d); 3rd tergum lacking distinct groove (cf. Fig. 14d); ovipositor about 1·3 × body length, 5 × length of hind femur.

Length. 10·0 mm.

Remarks. Very similar to *A. uchukqepi*, see remarks section of that species.

Distribution and Material examined. Map 20. Known only from the type locality in Chiapas, Mexico.

Holotype ♀, **Mexico**: Chiapas (*Conradt*) (MZP).

Alabagrus versicolor (Brèthes) **comb. n.**

(Figs 2d, 3f, 5e, 8c, 9a, 14d, 19c, Map 14)

Agathis versicolor Brèthes, 1909: 54. NEOTYPE ♂, Argentina, here designated (INTA).

Neotype ♂. *Colour.* Orange, black and yellow; orange as follows: antennal flagellomeres, pronotum in dorsal fifth, scutum except posterolateral corners, mesopleuron ventrally, metapleuron peripherally, hind leg, propodeum, and metasoma except terminal segment; black as follows: head excluding yellow palpi and orange flagellomeres, propleuron, most of pronotum, mesopleuron laterally, metapleuron medially, posterolateral corners of scutum, scutellum, terminal segment of metasoma; fore and mid leg black-brown basally to near apex of femur; fore and mid tibiae brown to yellow, their tarsi yellow; fore wing infuscate with stigma area yellow and basal area partially clear (Fig. 19c).

Head. Antenna with 35 flagellomeres; gena right angled posteroventrally (Fig. 2d). *Mesosoma.* Notauli weakly impressed (slightly more impressed than in Fig. 8c); median longitudinal ridge of scutum weak (cf. Fig. 9b); scutellar furrow smooth, lacking longitudinal carinae; apex of scutellum (posterior) smooth, lacking distinct transverse ridge (Fig. 9a); median areola of metanotum weakly excavated, posterior margin not elevated (Fig. 9a); sternaulus composed of 1 or 2 weak foveae posteroventrally (Fig. 5e); metapleuron mostly smooth with crenulae marginally (Fig. 5e); propodeum areolate, anterior transverse carina absent, other carina somewhat irregular (cf. Fig. 9b); mid tibia with 14 preapical spines; hind tibia with 26 apical spines (Fig. 3f); hind femur smooth ventrally (cf. Fig. 3c); 2·8 × longer than wide. *Metasoma.* 1st tergum with weak, median, longitudinal rise (Fig. 14d); 1st tergum 1·2 × longer than wide; 2nd plus 3rd tergum 1·2 × longer than wide; 2nd tergum with transverse depression (Fig. 14d); 3rd tergum lacking transverse depression (Fig. 14d).

Length. 6·9 mm.

FEMALE. As in male neotype except ovipositor 0·7 × body length, 2·8 × length of hind femur.

VARIATION ♀ ♂. Coloration somewhat variable, posterior half of scutum black (30%); scutellar furrow with median carina (Fig. 8c); apex of scutellum lacking transverse ridge (cf. Fig. 8a); mesopleuron mostly orange (20%); metapleuron entirely orange (60%); propodeal carinae often (70%) somewhat reduced anteriorly (Fig. 9a); length ♀, 5·7–7·1 mm; length ♂, 5·5–8·0 mm.

REMARKS. Holotype destroyed. The specimen designated as neotype fits the original description well.

DISTRIBUTION AND MATERIAL EXAMINED. Map 14. Brazilian Highlands south to Uruguay and west to north-eastern Argentina.

Neotype ♂, **Argentina**: Formosa, Malle (INTA).

Specimens that I have determined are deposited in the following institutions: AEI, AMNH, BMNH, CNC, CU, IML, INTA, NHMV, RNHL, TMB, USNM, ZMHB.

Alabagrus voto sp. n.

(Fig. 11e, Map 10)

HOLOTYPE ♀. *Colour.* Yellow except antenna and distal fifth of hind tibia brown, hind tarsus light brown; fore wing banded from base as follows: yellow, infuscate, yellow, infuscate (cf. Fig. 18d).

Head. Antenna with 39 flagellomeres; gena slightly expanded posteroventrally and evenly rounded (cf. Fig. 2f). *Mesosoma.* Notauli deeply impressed (cf. Fig. 9b); median longitudinal ridge of scutum very weak, lacking corresponding grooves (cf. Fig. 9b); scutellar groove with weak median longitudinal carina (cf. Fig. 7d); apex of scutellum with weak, rugose transverse ridge (cf. Fig. 7c); sternaulus short, restricted to 2 or 3 foveae posteroventrally, 0·3 × length of mesopleuron (cf. Fig. 5f); border between metepisternum and metepimeron crenulate (cf. Fig. 5d); metapleuron mostly smooth with crenulae along margins (cf. Fig. 5f); propodeum areolate, anterior transverse carina absent (cf. Fig. 9b); mid tibia with 5 preapical spines; hind tibia with 8 apical spines; hind femur smooth ventrally (cf. Fig. 3e), 3·7 × longer than wide. *Metasoma.* 1st tergum with short, weak, longitudinal ridge (cf. Fig. 14d); 1st tergum 1·1 × longer than wide; 2nd plus 3rd tergum 1·1 × longer than wide; 2nd tergum with weak transverse depression (cf. Fig. 14b); 3rd tergum lacking transverse depression (cf. Fig. 14d); ovipositor 0·6 × body length; 2·1 × length of hind femur.

Length. 7·1 mm.

ALLOTYPE ♂. As in ♀ holotype except as follows: metapleuron weakly rugose in ventral third; anterior areola of propodeum very narrow (cf. Fig. 8d); lateral areas of propodeum rugose (cf. Fig. 8a); 1st tergum of metasoma with strong, median, longitudinal carina (Fig. 11e); body length 6·8 mm.

VARIATION ♀ ♂. Female similar to holotype; metapleuron of males smooth to rugose in ventral third; anterior half of male propodea irregular, with anterior areola closed (i.e. lateral longitudinal carinae fused) or quite large, irregular and open; body length 6·0–7·3 mm.

DISTRIBUTION AND MATERIAL EXAMINED. Map 10. Known only from the type locality in north-western Costa Rica.

Holotype ♀, **Costa Rica**: Guanacaste, Santa Rosa Park, 2.viii.1978 (*Janzen*) (AEI).

Paratypes. **Costa Rica**: allotype ♂, same data as holotype except 27.v.1978; 2 ♀, 10 ♂, Santa Rosa Park, vi.–viii.x.1977 (*Janzen*) (AEI, CNC).

Alabagrus wachapu sp. n.

(Figs 10b, 11d, Map 7)

HOLOTYPE ♀. *Colour.* Black except: fore tarsus yellow; propodeum, tegula and 3 anterior metasomal terga all orange; fore wing infuscate with distal half of stigmal area yellow and wing base pale (cf. Fig. 19b, but stigma with more yellow than in figure).

Head. Antenna with 40 flagellomeres; gena right angled posteroventrally (cf. Fig. 2d). *Mesosoma.* Notauli deeply impressed (cf. Fig. 9b); scutum with weak, smooth, longitudinal ridge anteriorly (cf. Fig. 9b); scutellar furrow smooth with weak indication of median longitudinal carina posteriorly (cf. Fig. 7c); apex of scutellum smooth, lacking transverse ridge (cf. Fig. 8a); sternaulus weak, represented by several large foveae posteroventrally (cf. Fig. 5f); metapleuron smooth except for some crenulae anteriorly and on margins (cf. Fig. 5c); propodeal sculpture reduced, only median areola and posterior transverse carinae present (Fig. 10b); mid tibia with 2 preapical spines; hind tibia with 5 apical spines; hind femur smooth ventrally (cf. Fig. 3e), 3·7 × longer than wide. *Metasoma.* 1st tergum with strong, long, median,

longitudinal carina (Fig. 11d); 1st tergum 1·3 × wider than long; 2nd plus 3rd tergum 1·1 × wider than long; terga 2 and 3 with transverse depression (cf. Fig. 13b); ovipositor slightly shorter than body length (0·9 ×), 1·7 × length of hind femur.

Length. 8·2 mm.

VARIATION ♀. Colour somewhat variable, mid tarsus yellow, hind coxa yellow posteriorly, 4th metasomal tergum orange; metasomal sterna lighter in coloration than terga; base of fore wing infuscate (cf. Fig. 17e); gena acute posteroventrally (cf. Fig. 2e); mid tibia with 1–4 preapical spines; body length 6·8–8·2 mm.

DISTRIBUTION AND MATERIAL EXAMINED. Map 7. Ecuador south to Bolivia, east to Surinam and Para.

Holotype ♀, **Ecuador**: Napo, Limoncocha, 250 m, 15.–28.vi.1976 (*Peck*) (CNC).

Paratypes. **Bolivia**: La Paz: 1 ♀, Ixiamas, xii.1921 (*Mann*) (USNM). **Brazil**: Para: 3 ♀, Brasilia, Molnar, 1931 (TMB). **Ecuador**: Napo: 1 ♀, Limoncocha, 250 m, 4.ii.1974 (*Drummond*) (FSCA). **Surinam**: 1 ♀, Moengo, Boven, Cottica R., 12.v.1927 (CU); 2 ♀, Sint Barbara Pln., Surinam River, iv.1927 (CU). **Peru**: Ucayali: 1 ♀, Pacallpa, 14.x.1962 (*Schunke*) (BMNH). **Trinidad**: 1 ♀, Maracas, 17.xii.1952 (*Simmonds*) (CNC); 1 ♀, Simia, nr Arima, 250 m, 3.xii.1977 (*Mason*) (CNC).

Alabagrus waiwai sp. n.

(Map 12)

HOLOTYPE ♀. *Colour*. Black except palpi, fore and mid tarsi yellow; hind coxa, femur and part of tibia orange; metasoma orange with some black mottling and black apically; fore wing yellow, gradually becoming infuscate distally, infuscate distad 1*RS* cell (cf. Fig. 19a).

Head. Antenna with about 45 flagellomeres (antennae broken on holotype, number based on paratypes); gena acute posteroventrally (cf. Fig. 2e). *Mesosoma*. Notauli deeply impressed (cf. Fig. 9b); scutum with median longitudinal ridge weakly indicated anteriorly (cf. Fig. 9b); scutellar furrow mostly smooth with weak, median carinae indicated (cf. Fig. 7d); apex of scutellum with transverse ridge (cf. Fig. 9b); sternaulus foveolate, 0·5 × length of mesopleuron (cf. Fig. 4a); border between metepisternum and metepimeron crenulate (cf. Fig. 5d); metapleuron smooth (cf. Fig. 6c); propodeum mostly smooth with median longitudinal carinae indicated in anterior half and posterior transverse carinae indicated in posterior half (similar to Fig. 10e); mid tibia with 3 preapical spines; hind tibia with 3 apical spines; hind femur smooth ventrally (cf. Fig. 3e), 4·0 × longer than wide. *Metasoma*. 1st tergum convex (cf. Fig. 14b); 1st tergum 1·3 × longer than wide; 2nd plus 3rd tergum 1·1 × longer than wide; 2nd tergum with transverse depression (cf. Fig. 14); 3rd tergum lacking transverse depression (cf. Fig. 14d); ovipositor 0·6 × body length, 2·4 × length of hind femur.

Length. 7·8 mm.

VARIATION ♀. The two paratypes are almost identical to the holotype.

DISTRIBUTION AND MATERIAL EXAMINED. Map 12. Guyana and Para, Brazil.

Holotype ♀, **Guyana**: Amatuk, 12.ix.1937 (*Richards & Smith*) (BMNH).

Paratypes. **Brazil**: Para: 1 ♀, 9.i.1896 (*Austen*) (BMNH); 1 ♀, (*Baker*) (USNM).

Alabagrus waorani sp. n.

(Map 14)

HOLOTYPE ♀. *Colour*. Black and orange, with some yellow; fore and mid tarsi and palpi yellow; orange as follows: metapleuron, propodeum, hind coxa except laterally, hind femur and parts of hind tibia, first 3 segments of metasoma; fore wing yellowish hyaline basally, infuscate in distal third (cf. Fig. 19a).

Head. Antenna with 41 flagellomeres; gena right angled posteroventrally (cf. Fig. 2d). *Mesosoma*. Notauli deeply impressed (cf. Fig. 7d); median longitudinal ridge of scutum well defined (cf. Fig. 7d); scutellar furrow smooth, lacking longitudinal carinae (cf. Fig. 8a); apex of scutellum smooth, lacking transverse ridge and rugae (cf. Fig. 8a); sternaulus well impressed, foveolate, 0·5 × length of mesopleuron (cf. Fig. 4a); border between metepisternum and metepimeron crenulate (cf. Fig. 5d); metapleuron mostly smooth with several weak crenulae ventrally; propodeum areolate, anterior transverse carinae weak, absent laterally (cf. Fig. 9b); mid tibia with 2 preapical spines; hind tibia with 3 apical spines; hind femur smooth ventrally (cf. Fig. 3e), 3·7 × longer than wide. *Metasoma*. 1st tergum with small longitudinal bump anteromedially (cf. Fig. 14a); 1st tergum 1·2 × longer than wide; 2nd plus 3rd tergum 1·5 × longer than wide; 2nd tergum with weak transverse depression (cf. Fig. 14b); 3rd tergum lacking transverse depression (cf. Fig. 14d); ovipositor 0·7 × body length, 2·4 × length of hind femur.

Length. 6·6 mm.

VARIATION ♀. Essentially as in holotype; sculpture of propodeum and sternaulus can be reduced.

DISTRIBUTION AND MATERIAL EXAMINED. Map 14. Western Ecuador.
Holotype ♀, **Ecuador**: Napo, Limoncocha, 25.vi.1974 (*Drummond*) (FSCA).
Paratypes. **Ecuador**: Napo: 5 ♀, Limoncocha, on Rio Napo, vi., vii.1974 (*Drummond*) (FSCA).

Alabagrus warrau sp. n.

(Map 22)

HOLOTYPE ♀. *Colour.* Yellow except black as follows: antenna, hind tibia distally, and hind tarsus; fore wing without sharp border between infuscate terminal band and clear basal area (cf. Fig. 19a but with more pale coloration than in this figure).

Head. Antenna with 36 flagellomeres; gena right angled posteroventrally (cf. Fig. 2d). *Mesosoma.* Notauli well impressed (cf. Fig. 7d); scutum with median, longitudinal ridge (cf. Fig. 7d); scutellar furrow smooth, lacking longitudinal crenulae (cf. Fig. 8a); apex of scutellum with acute transverse ridge (cf. Fig. 8d); sternaulus foveolate, about 0·5 × length of mesopleuron (cf. Fig. 5c); border between metepisternum and metepimeron crenulate (cf. Fig. 5d); metapleuron mostly smooth with crenulae ventrally; propodeum areolate, mostly smooth anteriorly, anterior transverse carina absent, anterior median areola weak (cf. Fig. 8c); mid tibia with 3 preapical spines; hind tibia with 3 apical spines; hind femur rugose ventrally (cf. Fig. 3c), 3·8 × longer than wide. *Metasoma.* 1st tergum mostly flat with small anterior bump (cf. Fig. 14a); 1st tergum 1·6 × longer than wide; 2nd plus 3rd tergum 1·4 × longer than wide; 2nd tergum with weak transverse depression (cf. Fig. 14b); 3rd tergum lacking transverse depression (cf. Fig. 14d); ovipositor 0·9 × body length, 2·5 × length of hind femur.

Length. 5·3 mm.

VARIATION ♀. Entirely yellow except black or brown antenna; head entirely black to entirely yellow except antennae; fore and mid legs all melanic except coxae and tarsi; hind trochanter black; fore wing with sharp border between infuscate terminal band and clear basal area (cf. Fig. 19d); sternaulus 0·3–0·5 × length of mesopleuron; anterior areola of propodeum sometimes will defined on all sides; 1st metasomal tergum 1·2–1·6 × longer than wide; body length 5·0–6·0 mm.

DISTRIBUTION AND MATERIAL EXAMINED. Map 22. Scattered distribution from San Luis Potosi, Mexico, south through Central America to Colombia, and east to Trinidad.

Holotype ♀, **Trinidad**: 830 m, Morne Bleu, 7.–28.viii.1969 (*Howden*) (AEI).

Paratypes. **Colombia**: 1 ♀, state?, Tolima (*Micholitz*) (ZMHB). **Costa Rica**: 1 ♀, Guanacaste, Santa Rosa Park, 24.vi.1977 (*Janzen*) (AEI); 1 ♀, Guancaste, Santa Rosa Park, 30.viii.1977 (*Janzen*) (AEI); 1 ♀, Turrialba, viii.1963 (*Porter*) (MCZ). **Mexico**: San Luis Potosi: 1 ♀, 1 mi [1·6 km] W. Ciudad Santos, 14.iii.1977 (*Gruetzmacher, Sweet, Jorden & Schaffner*) (TAM). **Trinidad**: 3 ♀, same data as holotype; 1 ♀, Champs Fleurs, 5.ii.1953 (*Simmonds*) (CNC); 2 ♀, Cumuto Arepo, Savanna, iv.1913 (*Thaxter*) (MCZ); 7 ♀, Curepe, x.–xi.1976 (*Bennett*) (BMNH); 1 ♀, Curepe, 1.ii.1961 (CNC); 5 ♀, Saint Augustine, viii.1976 (BMNH). 2 ♀, Saint Augustine, 18.xii.1952 (CNC); 1 ♀, Santa Cruz Valley, 7.ii.1961 (CNC); 2 ♀, 28.xi., 20.xii.1928 (*Myers*) (BMNH).

Alabagrus watachupa sp. n.

(Map 5)

HOLOTYPE ♀. *Colour.* Black and red with some yellow and orange; fore and mid tarsi and femoral-tibial joints of fore and mid legs yellow; palpi yellow; lateral lobes of scutum orange; following areas red: metanotum, propodeum, metapleuron, hind leg, and metasoma except terminal segment; fore wing infuscate with stigmal area yellow and basal area of wing becoming progressively paler and clear at extreme base (cf. Fig. 20c).

Head. Antenna with 42 flagellomeres; gena right angled posteroventrally (cf. Fig. 2d). *Mesosoma.* Notauli weakly impressed (cf. Fig. 8c); scutum lacking median longitudinal ridge (cf. Fig. 8a); scutellar furrow smooth, lacking longitudinal carinae (cf. Fig. 8a); apex of scutellum (posterior) smooth, lacking transverse ridge (cf. Fig. 8a); median areola of metanotum weakly excavated, lacking raised margin posteriorly (cf. Fig. 9a); sternaulus weak, 0·2 × length of mesosoma, composed of 1 or 2 foveae posteroventrally (cf. Fig. 5f); border between metepisternum and metepimeron crenulate (cf. Fig. 5d); metapleuron mostly smooth with crenulae along margins (cf. Fig. 5f); propodeum areolate, anterior transverse carina abbreviated (cf. Fig. 9b), anterior areola more than 2 × longer than posterior areola (cf. Fig. 9d); mid tibia lacking preapical spines; hind tibia with 4 apical spines; hind femur smooth ventrally (cf.

Fig. 3e), wide, 3·3 × longer than wide. *Metasoma.* 1st tergum with pronounced anteromedial bump (cf. Fig. 15d); 1st tergum 1·4 × longer than wide; 2nd plus 3rd tergum 1·5 × longer than wide; both 2nd and 3rd tergum with transverse depression (cf. Fig. 13b); ovipositor short 0·4 × body length, 1·6 × length of hind femur.

Length. 7·2 mm.

VARIATION ♀. The sole paratype is essentially as the holotype.

DISTRIBUTION AND MATERIAL EXAMINED. Map 5. Known only from the type locality in Jujuy, Argentina.

Holotype ♀, **Argentina**: Jujuy, 16.i.1966 (*Townes*) (AEI).

Paratype. 1 ♀, same data as holotype except 13.i.1966.

Alabagrus xipe sp. n.

(Map 9)

HOLOTYPE ♀. *Colour.* All orange except black as follows: head, all legs except hind coxa basally and medially; fore wing deeply infuscate (cf. Fig. 16).

Head. Antenna with 45 flagellomeres; gena rounded posteroventrally (cf. Fig. 2b). *Mesosoma.* Notauli well impressed (cf. Fig. 7b); scutum with weak median longitudinal ridge (cf. Fig. 9b); scutellar furrow with weak median longitudinal carina (cf. Fig. 7c); apex of scutellum with weak, rugose, transverse, ridge (cf. Fig. 7b); sternaulus foveolate, 0·5 × length of mesopleuron (cf. Fig. 5c); border between metepisternum and metepimeron crenulate (cf. Fig. 5d); metapleuron smooth except short crenulae on margins (cf. Fig. 4e); propodeum mostly smooth with some weak carina (cf. Fig. 7c); mid tibia with 1 preapical spine; hind tibia with 8 apical spines; hind femur punctate ventrally (appearing intermediate between Figs 3b and 3a), 3·9 × longer than wide. *Metasoma.* 1st tergum convex, without distinct anterior bump (cf. Fig. 14b); 1st tergum 1·6 × longer than wide; 2nd plus 3rd tergum 1·8 × longer than wide; neither 2nd nor 3rd tergum with distinct transverse depression (cf. Fig. 15a); ovipositor 1·6 × body length, 3·9 × length of hind femur.

Length. 10·4 mm.

ALLOTYPE ♂. Similar to holotype except as follows: pro- and mesopleuron below sternaulus melanic; metapleuron rugose in ventral half and on margins (cf. Fig. 4c); 1st metasomal tergum with distinct median carinae (cf. 13c).

VARIATION ♀ ♂. Usually as in holotype but venter of mesosoma can be brown; 1 female has pronotum, scutum and mesopleuron all black; flagellomere number varies from 45–49; propodeum smooth or with rugae restricted to the margins (cf. Fig. 10a) or with weak carina (cf. Fig. 7c); length 10·2–12·4 mm; 1st metasomal tergum of male can lack median carina.

HOST. *Diatraea lineolata* Walker on maize.

DISTRIBUTION AND MATERIAL EXAMINED. Map 9. Near Mexico City south to southern Honduras.

Holotype ♀, **Mexico**: Morelos, 6 mi [9·6 km] S Temixco, 16.vii.1963 (*Parker & Stange*) (USNM).

Paratypes. **El Salvador**: 1 ♀, 4·8 km S. Quezaltepeque, 19.vii.1961 (*Irwin*) (USNM). **Honduras**: 9 ♀, 1 ♂, 30 km SE. Tegucigalpa, 23.vii.1985 (*Sequeira*) (TAMU); 2 ♀, same data except 3.x.1985; 1 ♀, same data except 24.xii.1985; 2 ♀, Zamorano, 17.ii.1957 (*Beans*) (USNM). **Mexico**: allotype ♂, Guerrero, Iquala, ex maize, viii.1952 (*Flores*) (TAMU). Guerrero: 2 ♀, same data as allotype; Morelos: 1 ♀, same data as holotype; 1 ♀, Cuernavaca, 9.vii.1961 (*Dreisbach*) (MSUE); Oaxaca: 1 ♀, Oaxaca (*Deppe*) (ZMHB); Veracruz: 1 ♀, nr Cordoba, 750 m, ex *Diatraea lineolata* Walker on maize, 25.v.1952 (*Box*) (USNM).

Alabagrus xolotl sp. n.

(Figs 6a, 14c, Map 20)

HOLOTYPE ♀. *Colour.* Yellowish orange except: head and all trochanters black; hind tarsus and tibia brown apically; fore wing infuscate (cf. Fig. 16).

Head. Antenna with 44 flagellomeres; gena rounded posteroventrally (cf. Fig. 2b). *Mesosoma.* Notauli well impressed (cf. Fig. 7b); scutum lacking median longitudinal ridge (cf. Fig. 8c); scutellar furrow with weak median carina (cf. Fig. 7c); apex of scutellum with weak transverse rugose ridge (cf. Fig. 7b); sternaulus foveolate, 0·5 × length of mesopleuron (Fig. 6a); border between metepisternum and metepimeron crenulate (cf. Fig. 5d); metapleuron smooth except for short crenulae along margins (cf. Fig. 4e); propodeum with weak irregular sculpture (cf. Fig. 7b, but weaker); mid tibia with 12 preapical spines; hind tibia with about 13 apical spines; hind femur smooth ventrally (cf. Fig. 3e), 4·8 × longer than wide.

Metasoma. 1st tergum flat, lacking anteromedial bump (Fig. 14c); 1st tergum 1·4 × longer than wide; 2nd plus 3rd tergum 1·6 × longer than wide; neither 2nd nor 3rd tergum with distinct transverse depression (cf. Fig. 15a); ovipositor 1·1 × body length, 4·5 × length of hind femur.

Length. 9·4 mm.

ALLOTYPE ♂. (Males are strikingly different from females, especially in coloration and sculpture.) Black and orange; head and body of mesosoma black; fore and mid legs mostly black, hind legs mostly black basally and hind tibia also partly melanic; apex of metasoma black; remainder of body orange; scutellar groove with 3 longitudinal carinae; transverse ridge at apex of scutellum lacking rugae (cf. Fig. 7d); metapleuron with longitudinal rugae in ventral third (cf. Fig. 6a); propodeum areolate, anterior transverse carina lacking (cf. Fig. 9b); mid tibia with 26 weak preapical spines (some are intermediate between setae and true spines); hind tibia with 18 apical spines; 1st metasomal tergum with short, median, longitudinal ridge (cf. Fig. 14d).

VARIATION ♀. Legs can be almost completely yellowish orange; trochanters all yellowish orange; rarely small patch of orange on face; sternaulus often reduced to a smooth groove 0·5 × length of mesopleuron (cf. Fig. 5d); propodeum varies from weakly and irregularly areolate to smooth; mid tibia with 8–14 preapical spines.

VARIATION ♂. Hind coxa orange to black; metasoma entirely orange; fore and mid tibia orange to black; scutum, scutellum, metanotum, propodeum and rarely metapleuron orange; posterior transverse ridge of scutellum absent (cf. Fig. 8a); propodeal sculpture reduced to areolate-rugose medially and smooth laterally with only posterior transverse and median longitudinal carinae well defined (cf. Fig. 8c, but more rugose medially); mid tibia with 12–30 small preapical spines; hind tibia with 14–20 apical spines; body length 7·5–9·0 mm.

DISTRIBUTION AND MATERIAL EXAMINED. Map 20. Widespread in Arizona and south to Chiapas.

Holotype ♀, **Mexico**, Durango, 5 mi [8 km] W. Durango, 6,500′ [2000 m], 20.iv.1964 (*Mason*) (CNC).

Paratypes. **Mexico**: allotype ♂, same data as holotype except 14.vi.1964 (*McAlpine*); Chiapas: 1 ♂, San Christobol de las Casas, 2.vi.1969 (CNC); Chihuahua: 1 ♀, 1 ♂, 16 mi [25·6 km] SE. Chihuahua, 11.vii.1947 (*Cazier*) (AMNH); Durango: 3 ♀, 15 ♂, same data as holotype; 2 ♀, same data as holotype except 29.vi.1964, 14.vii.1964; 1 ♀, 7 mi [11·2 km] W. Durango, 7,000′ [2150 m], 13.vii.1964 (*Mason*) (CNC); 1 ♀, 16 mi [25·6 km] W. Durango 7,000′ [2150 m], 3.vii.1964 (*Mason*) (CNC); 1 ♀, 5 mi [8 km], W. Durango, 23.vi.1964 (*Howden*) (CNC); 1 ♂, 16 km W. Durango, 12.vii.1964 (*MacSwain*) (UCB); 1 ♀, 23 mi [36·8 km] W. Durango, 7,500 ft [2,300 m], 27.vi.1964 (*Kelton*) (CNC); Morelos: 2 ♀, 3 mi [4·8 km] NW. Cuernavaca, 6,500 ft [2000 m], 3.vi.1959 (*Evans*) (CU); Sonora: 1 ♀, 9 mi [14·4 km] E. Chupaderos, 3.vii.1963 (*Parker & Stange*) (USNM). **U.S.A.**: Arizona: 2 ♀, (ANSP); 1 ♀, Chino Val., 27.vii.1956 (*Gehard & Betler*) (USNM); 1 ♀, Ramsey Cyn., 6,500′ [2000 m], 15 mi [24 km] S. Sierra Vista, Huachuca Mts, 22.vii.1967 (*Sternitzky*) (CNC); 1 ♂, 8 mi [12·8 km] S. Rodeo, Hidalgo Co., 27.vii.1959 (*Statham*) (AMNH); 1 ♂, 16 km N. Prescott, Yavapai Co., 24.vii.1949 (*Gertsch*) (AMNH); 1 ♀, Sonita, 10.vii.1959 (*Butler*) (USNM); 1 ♀, 20 mi [32 km] W. Springerfield, Apache Co., White Mts, desert grassland, 23.vii.1948 (*Nutting*) (IML); Texas: 1 ♂, Marfa, 3.–6.vii.1899 (*Wickham*) (AMNH); 1 ♂, 10–15 km W. Ft Davis on Hwy 166, 1500 m, 15.–23.vii.1948 (CNC).

Alabagrus yanamapa sp. n.

(Map 11)

HOLOTYPE ♀. *Colour.* Black and orange; following areas orange: fore and mid tarsi, hind coxa and femur, tegula, metapleuron posteriorly and dorsally, propodeum, segments 1–4 of metasoma and anterior portions of segments 5, 6 and 7; fore wing banded from base as follows: yellow, infuscate, yellow, infuscate (cf. Fig. 8d).

Head. Antenna with about 46 flagellomeres (antennae broken, approximation based on related species); gena rounded posteroventrally (cf. Fig. 2b). *Mesosoma.* Notauli weakly impressed (cf. Fig. 8c); scutum lacking median longitudinal ridge (cf. Fig. 2c); scutellar furrow smooth, lacking longitudinal carinae (cf. Fig. 8a); apex of scutellum smooth, lacking transverse ridge (cf. Fig. 8a); median areola of metanotum with weakly raised posterior margin (cf. Fig. 7d); sternaulus foveolate, 0·5 × mesopleuron length, with many foveae (cf. Fig. 6a); border between metepisternum and metepimeron crenulate (cf. Fig. 5d); metapleuron smooth, with several crenulae anteriorly; propodeum smooth with very weak indication of carinae in posterior half (cf. Fig. 10a); carina between propodeum and metapleuron complete; mid tibia with 1 preapical spine; hind tibia with 14 apical spines; hind femur smooth ventrally (cf. Fig. 3e), 4·0 × longer than wide. *Metasoma.* 1st tergum slightly raised medially (cf. Fig. 14b), 1·7 × longer than wide; 2nd plus

3rd tergum 1·6 × longer than wide; 2nd tergum with weak transverse depression (cf. Fig. 14d); 3rd tergum lacking transverse depression; ovipositor 1·5 × body length, 7·2 × length of hind femur.

Length. 10·8 mm.

VARIATION ♀. Sole paratype essentially as in the holotype except some black mottling on metasomal terga 1–3; body length 9·8 mm.

DISTRIBUTION AND MATERIAL EXAMINED. Map 11. Surinam.

Holotype ♀, **Surinam**: Zanderij, 16.vi.1963 (*Van der Vecht*) (RNHL).

Paratype. **Surinam**: 1 ♀, Republick, 9.v.1963 (*Van der Vecht*) (RNHL).

Alabagrus yaruro sp. n.

(Map 22)

HOLOTYPE ♀. *Colour*. Yellow except black as follows: head except palpi, propleuron, fore and mid legs except tarsi, hind coxa laterally, hind trochanter, hind tibia distally and hind tarsus; metasoma with some black mottling dorsally (I doubt this mottling is consistent within the species); fore wing yellowish hyaline basally, infuscate in distal fifth (cf. Fig. 19d).

Head. Antenna with ? flagellomeres (broken); gena acute posteroventrally (cf. Fig. 2e). *Mesosoma*. Notauli deeply impressed (cf. Fig. 7d); median longitudinal ridge of scutum well defined (cf. Fig. 7d); scutellar furrow smooth, lacking longitudinal carinae (cf. Fig. 8a); apex of scutellum with weak indication of transverse ridge (cf. Fig. 7b); sternaulus foveolate, 0·5 × length of mesopleuron (cf. Fig. 4a); border between metepisternum and metepimeron crenulate (cf. Fig. 5d); metapleuron mostly smooth with crenulae margins (cf. Fig. 5c); propodeum areolate (cf. Fig. 7d); mid tibia lacking preapical spines; hind tibia with 3 apical spines; hind femur smooth ventrally (cf. Fig. 3e), 4·1 × longer than wide. *Metasoma*. 1st tergum with small longitudinal rise anteromedially (cf. Fig. 14d); 1st tergum 1·2 × longer than wide; 2nd plus 3rd tergum 1·5 × longer than wide; 2nd tergum with transverse depression (cf. Fig. 14d); 3rd tergum lacking transverse depression (cf. Fig. 14d); ovipositor 0·6 × body length, 2·5 × length of hind femur.

Length. 8·6 mm.

VARIATION ♀. Sole paratype essentially as in the holotype.

DISTRIBUTION AND MATERIAL EXAMINED. Map 22. Known only from the type locality in Venezuela.

Holotype ♀, **Venezuela**: Carabobo, San Esteban Valley, Las Quiguas, 11.–19.i.1940 (*Anduze*) (USNM).

Paratype. **Venezuela**: Carabobo: 1 ♀, San Esteban Valley, Las Quiguas, 1.–8.i.1940 (*Anduze*) (USNM).

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References

Ashmead, W. H. 1900. Report on the Aculeate Hymenoptera of the islands of St. Vincent and Grenada, with additions to the parasitic Hymenoptera and a list of the described Hymenoptera of the West Indies. *Transactions of the Entomological Society of London* **1900**: 207–367.

Bhat, S. & Gupta, V. K. 1977. The subfamily Agathidinae. Ichneumonologica Orientalis, Part VI. *Oriental Insects* no. 6: 353 pp.

Brèthes, J. 1927. Parasites and hyperparasites of *Diatraea saccharalis* in Tucman sugarcane. *Bulletin of Entomological Research* **18**: 205–207.

Brullé, M. A. 1846. Hyménoptères IV. *In* LeComte, M. (Ed.), *Histoire Naturelle des Insectes*. Paris.

Cameron, P. 1887. Insecta. Hymenoptera, 1. *Biologia centrali-americana* **1**: 1–487.

—— 1905. Descriptions of new species of Neotropical Hymenoptera. *Transactions of the American Entomological Society* **31**: 373–388.

—— 1911. On the Hymenoptera of the Georgetown Museum, British Guiana, Demerara. *Timehri* **1**: 306–330.

Cresson, E. T. 1865. On the Hymenoptera of Cuba. *Proceedings of the Entomological Society of Philadelphia* **4**: 1–200.

—— 1872. Texan Hymenoptera. *Transactions of the American Entomological Society* **4**: 153–292.

—— 1873. Descriptions of North American Hymenoptera No. 5. *The Canadian Entomologist* **5**: 51–54.

Cushman, R. A. 1929. *In* Plank, H. K., Natural enemies of the sugar cane moth stalkborer in Cuba. *Annals of the Entomological Society of America* **22**: 621–640.

Dondale, C. D. 1954. Biology of *Agathis laticinctus* (Cress.) (Hymenoptera: Braconidae), a parasite of the eye-spotted bud moth, in Nova Scotia. *The Canadian Entomologist* **86**: 40–44.

Enderlein, G. 1920. Zur Kenntnis aussereuropäischer Braconiden, Agathidinae. *Archiv für Naturgeschichte* **84**(A) 11 (1918): 162–213.

Fischer, M. 1977. Hymenoptera Braconidae (opiinae II). *Das Tierreich* **96**: 1–1001.

Hecht, M. K. & Edwards, J. L. 1977. The methodology of phylogenetic inference above the species level. *In* Hecht, M. K., Goody, P. C. & Hecht, B. M. (Eds), *Major Patterns in Vertebrate Evolution* **14**. New York & London.

Hennig, W. 1950. *Grundzuge einer Theorie der phylogenetischen Systematik* 370 pp. Berlin.

—— 1966 *Phylogenetic Systematics* 263 pp.

Heppner, J. B. & Lamas, G. 1982. Acronyms for world museum collections of insects with an emphasis on Neotropical Lepidoptera. *Bulletin of the Entomological Society of America* **28**: 305–315.

Hodges, R. W. *et al.* 1983. *Check list of Lepidoptera of America north of Mexico* 284 pp. London.

Hummelen, P. J. 1974. Relations between two rice borers in Surinam, *Rupela albinella* (Cr.) and *Diatraea saccharalis* (F.), and their hymenopterous larval parasites. *Mededelingen landbouwhogeschool, Wageningen* **74** (1): 1–88.

Mason, W. R. M. 1986. Standard drawing conventions and definitions for venational and other features of wings of Hymenoptera. *Proceedings of the Entomological Society of Washington* **88**: 1–7.

Muesebeck, C. F. W. 1927. A revision of the parasitic wasps of the subfamily Braconinae occurring in America north of Mexico. *Proceedings of the United States National Museum* **69**: 1–73.

Muesebeck, C. F. W. & Walkley, L. M. 1951. *In* K. V. Krombein *et al.*, Hymenoptera of America north of Mexico. Synoptic Catalog. *Agriculture Monographs* **2** (1): 305 pp.

Myers, J. G. 1931. Descriptions and records of Hymenoptera from British Guiana and W. Indies. *Bulletin of Entomological Research* **22**: 267–277.

—— 1932. Biological observations on some Neotropical parasitic Hymenoptera. *Transactions of the Entomological Society of London* **80**: 121–126.

Needham, J. G. 1955. Notes on a leaf-rolling caterpillar and on some of its associates. *Ecology* **36**: 346–352.

Nelson, G. 1979. Cladistic analysis and synthesis; principles and definitions with a historical note on Adanson's 'Familles des Plantes' (1763–1764). *Systematic Zoology* **28**: 1–21.

Richards, O. W. 1977. Hymenoptera: introduction and key to families, 2nd edn. *Handbooks for the Identification of British Insects* **4** (1): 1–100.

Riegel, G. T. 1948. The wings of Braconidae. *Annals of the Entomological Society of America* **41**: 439–449.

Say, T. 1836. Descriptions of new species of North American Hymenoptera and observations on some already described. *Boston Journal of Natural History* **1**: 210–305.

Sharkey, M. J. 1985. Notes on the genera *Bassus* Fabricius and *Agathis* Latreille, with a description of *Bassus arthurellus* n. sp. (Hymenoptera: Braconidae). *The Canadian Entomologist* **117**: 1497–1502.

—— 1986. *Pharpa*, a new genus of neotropical Agathidinae (Hymenoptera, Braconidae) with a discussion of phylogenetic relationships. *The Canadian Entomologist* **118**: 1231–1239.

Shenefelt, R. D. 1970. *Hymenopteroum Catalogus*. Braconidae 3. Agathidinae. Pars 6: 306–428.

Spinola, M. 1840. Hyménoptères recueilis à Cayenne en 1839 par M. leprieur pharmacien de la Marine Royale. *Annales de la Société Entomologique de France* **9**: 129–204.

Swofford, D. L. 1985. Phylogenetic analysis using parsimony, version 2.4. Unpublished manuscript.

Szépligeti, G. V. 1902. Tropische Cenocelioniden und Braconiden aus der Sammlung des Ungarischen National-Museums. *Természetrajzi Fuzetek* **25**: 39–84.

—— 1904. Hymenoptera Fam. Braconidae. *Genera Insectorum* **4** (22): 253 pp.

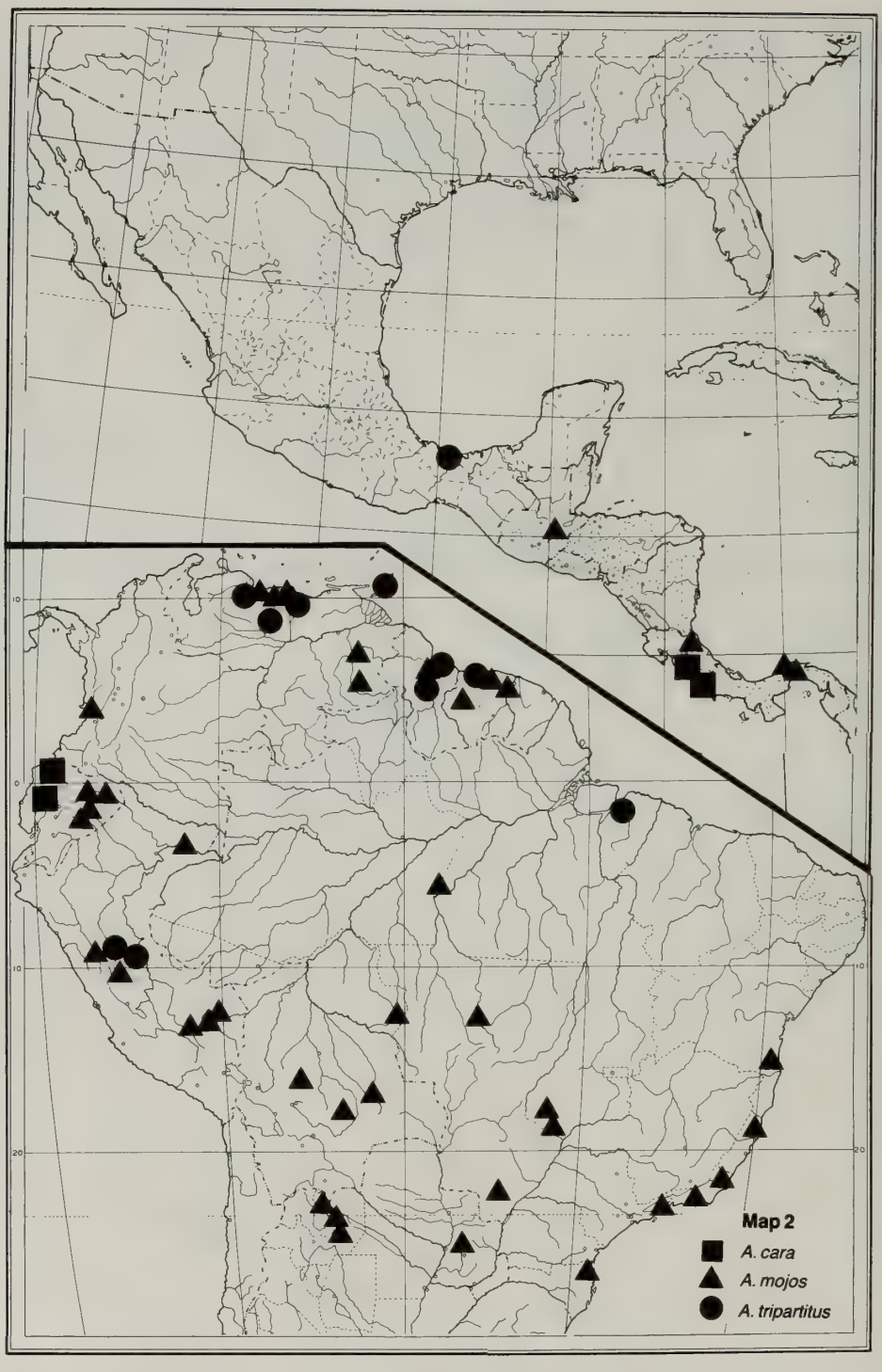
—— 1908. Braconiden aus der Sammlung des Ungarischen National-Museums. *Annales Historico-Naturales Musei Nationalis Hungarici* **6**: 397–427.

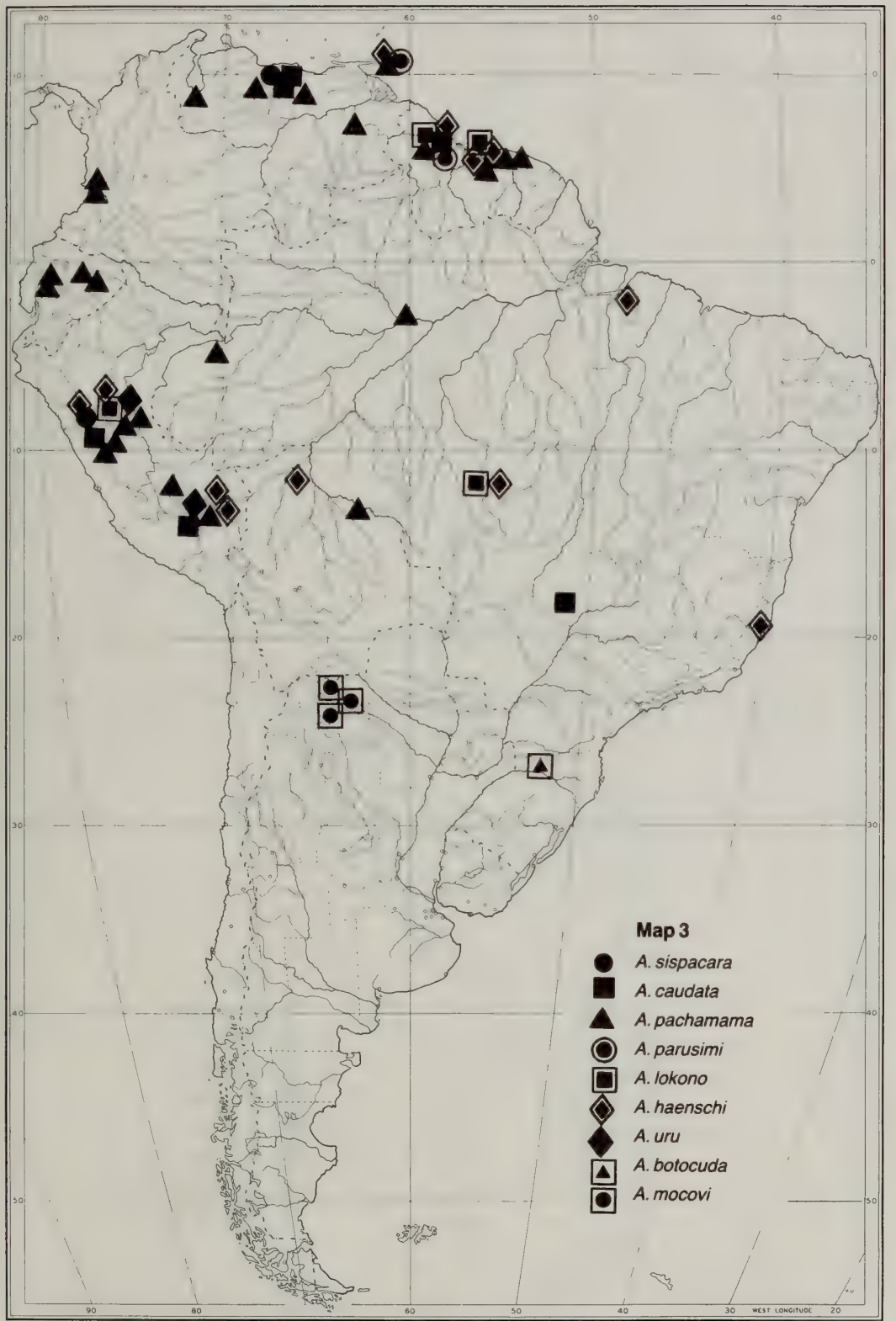
Thompson, W. R. 1953. *A catalogue of the parasites and predators of insect pests*. Section 2. Host parasite catalogue. Part 2. Hosts of the Hymenoptera (Agaonidae to Braconidae). 190 pp. Ottawa.

Turner, R. E. 1918. On Braconidae parasitic on *Diatraea saccharalis* in Demerara. *Bulletin of Entomological Research* **9**: 81–82.

Van Dine, D. L. 1929. Parasites of sugar cane moth borers. *Journal of Economic Entomology* **22**: 248–268.
Viereck, H. L. 1905. Notes and descriptions of Hymenoptera from the western United States in the collection of the University of Kansas. *Transactions of the Kansas Academy of Science* **19**: 264–326.
—— 1917 (1916). Guide to the insects of Connecticut, part III, the Hymenoptera, or wasp-like insects of Connecticut. *Bulletin. Connecticut State Geological and Natural History Survey* no. 22 (1916): 824 pp.
Vockeroth, J. R. 1966. A method of mounting insects from alcohol. *The Canadian Entomologist* **98**: 69–70.
Watrous, L. E. & Wheeler, Q. D. 1981. The out-group comparison method of character analysis. *Systematic Zoology* **30**: 1–11.
Weiss, H. B. & Ziegler, G. M. 1931. *Thomas Say, early American naturalist* 260 pp. Baltimore.
Wiley, E. O. 1981. *Phylogenetics: the Theory and Practice of Phylogenetic Systematics* xv + 439 pp. Toronto.

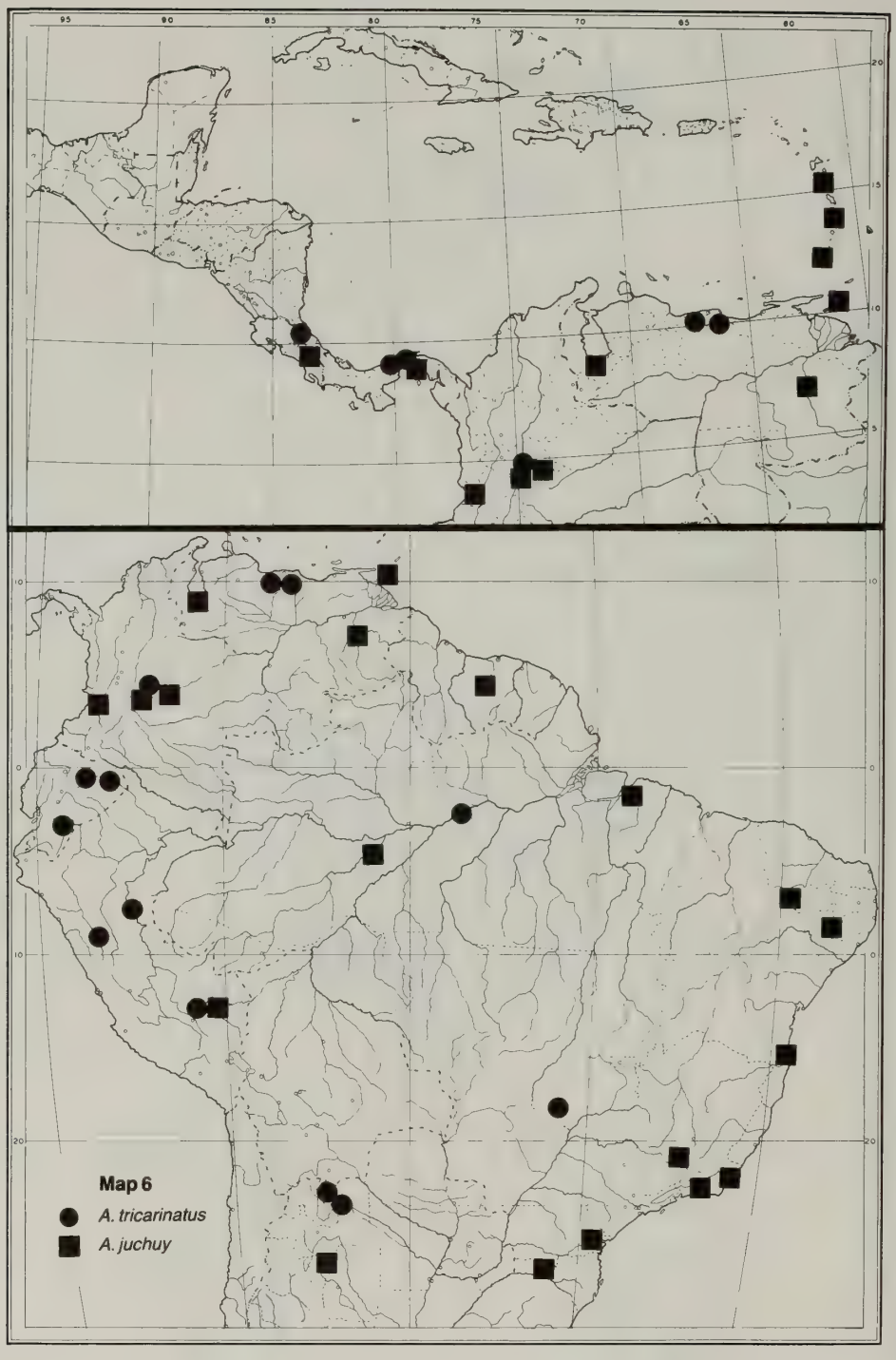
Map 1
A. stigma


Map 2
A. cara
A. mojos
A. tripartitus

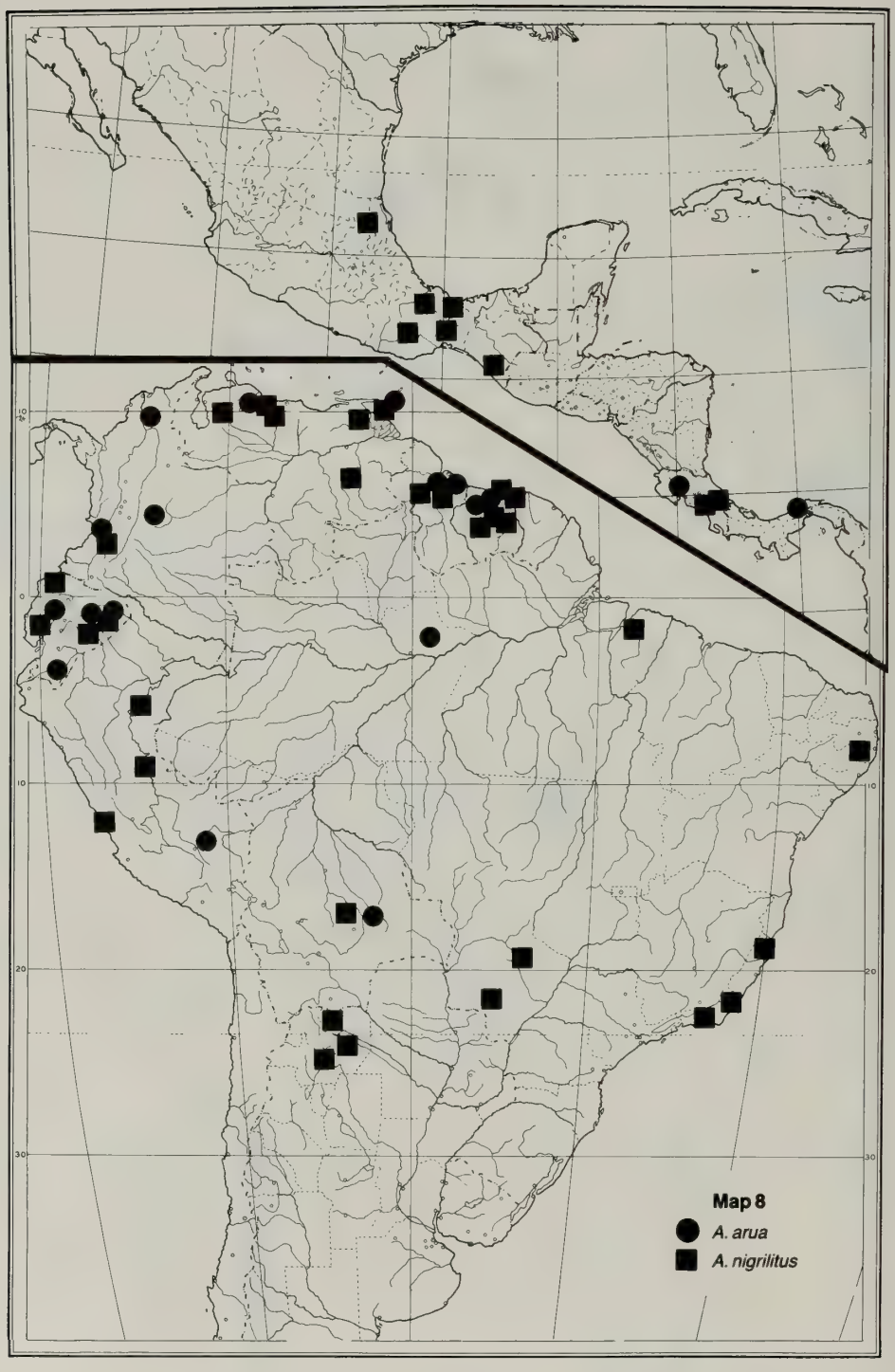

Map 3
A. sispacara
A. caudata
A. pachamama
A. parusimi
A. lokono
A. haenschi
A. uru
A. botocuda
A. mocovi
WEST LONGITUDE

Map 4
A. caingaing
A. kiska
A. esembecki
A. shorteri
A. chimu
A. mataco
A. erythromelas
A. laevis
WEST LONGITUDE

Map 5
A. watachupa
A. tupinamba
A. aa
A. parunaupi
A. semialbus
A. maue
A. intimapa
A. puri
WEST LONGITUDE


Map 6
A. tricarinatus
A. juchuy

Map 7
A. latisoma
A. elatoscutum
A. levipodeum
A. solox
A. latreillei
A. wachapu
A. variegatus
A. guayaki
WEST LONGITUDE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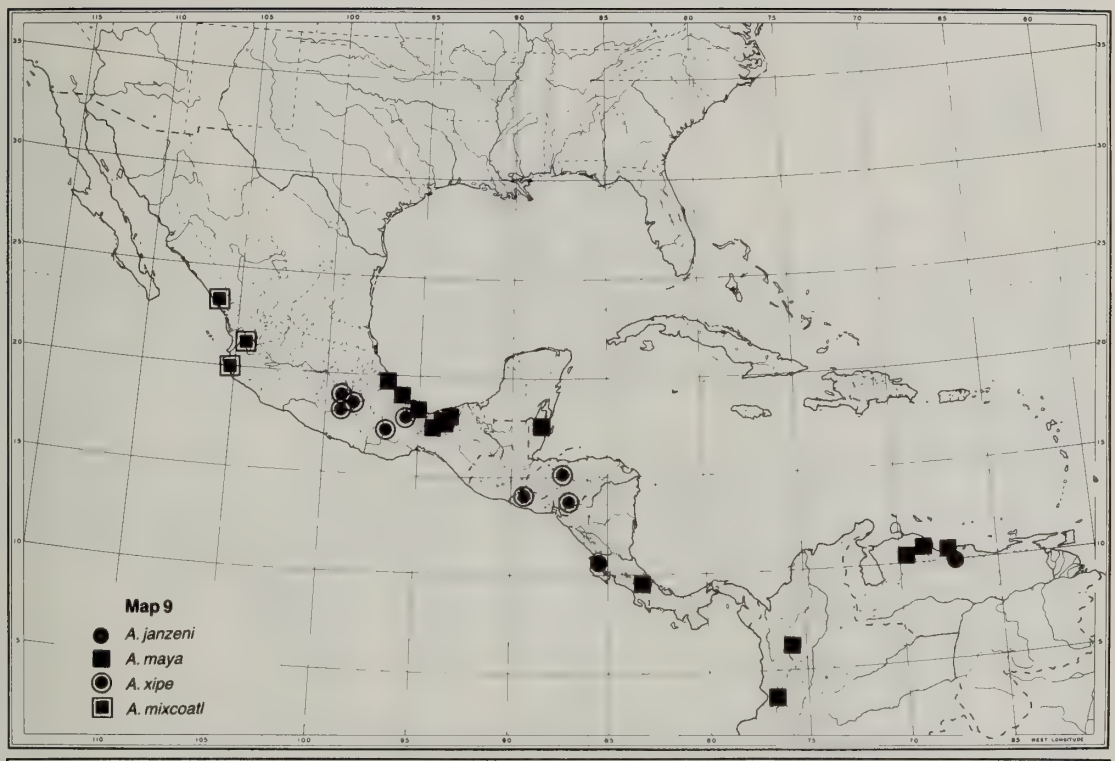
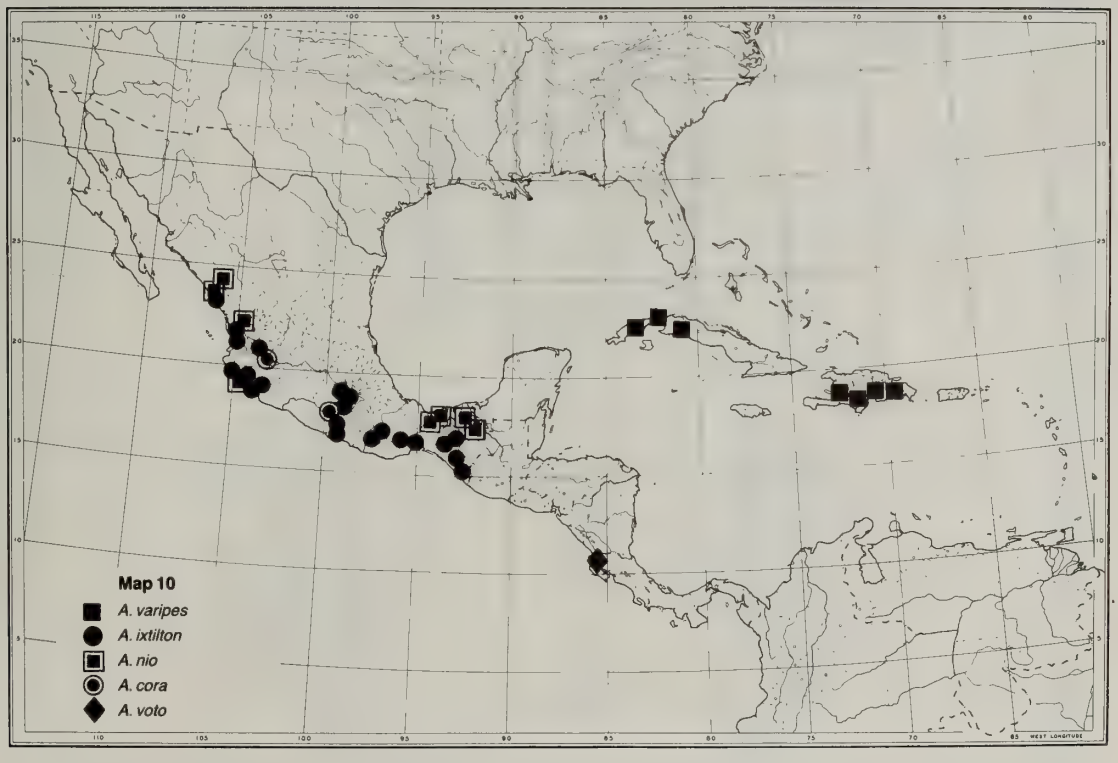
A. nigrilitus


Map 9
A. janzeni
A. maya
A. xipe
A. mixcoatl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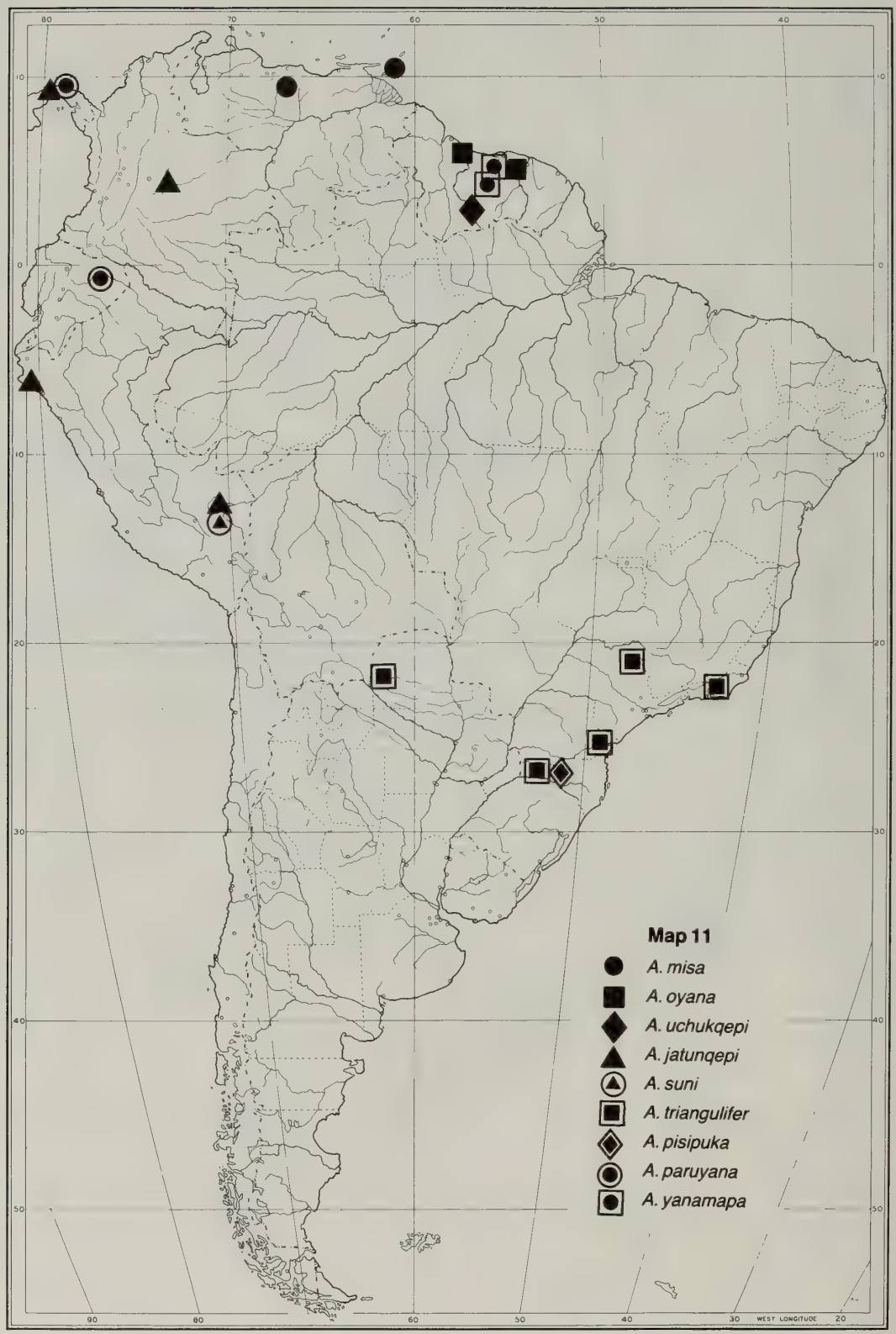
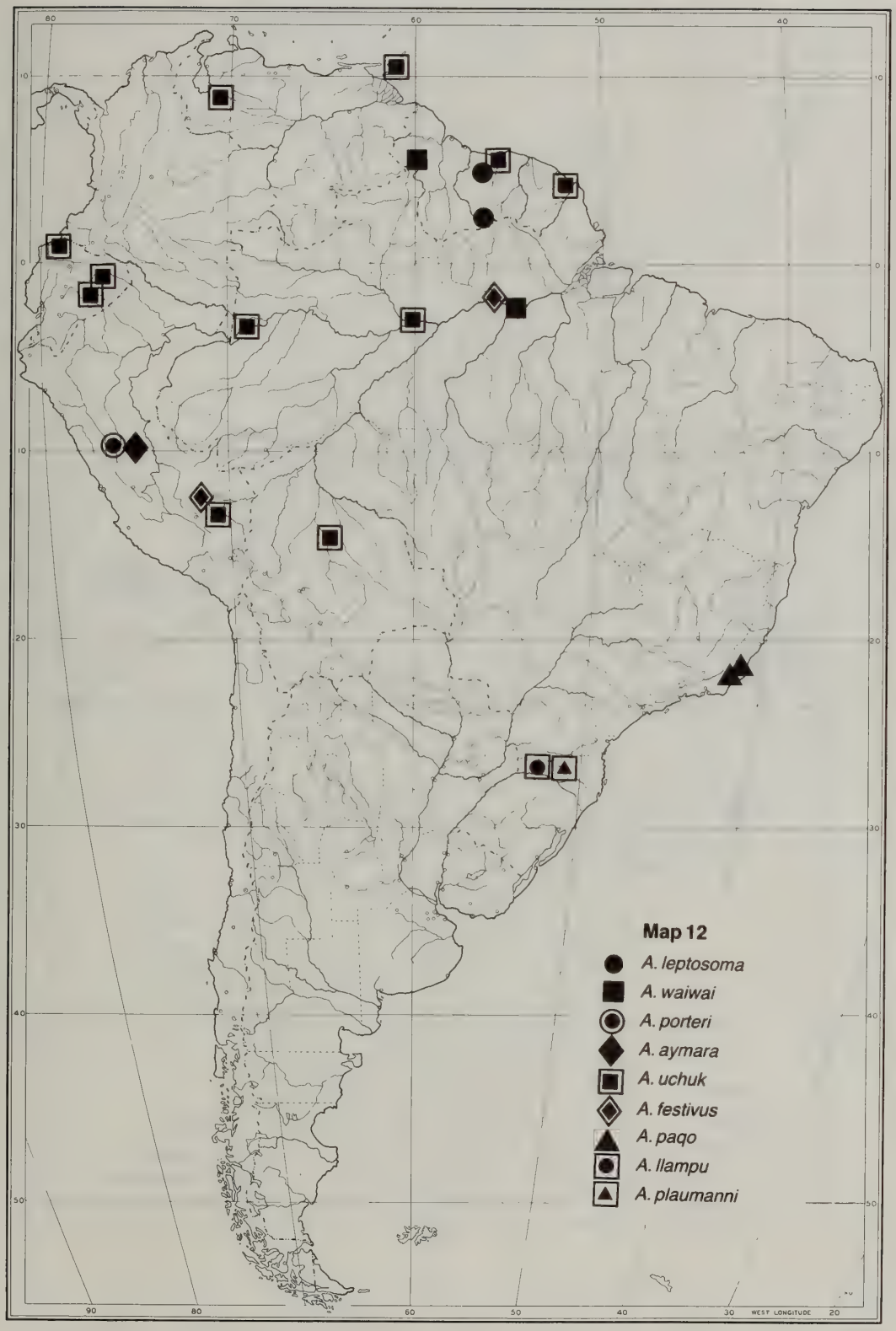
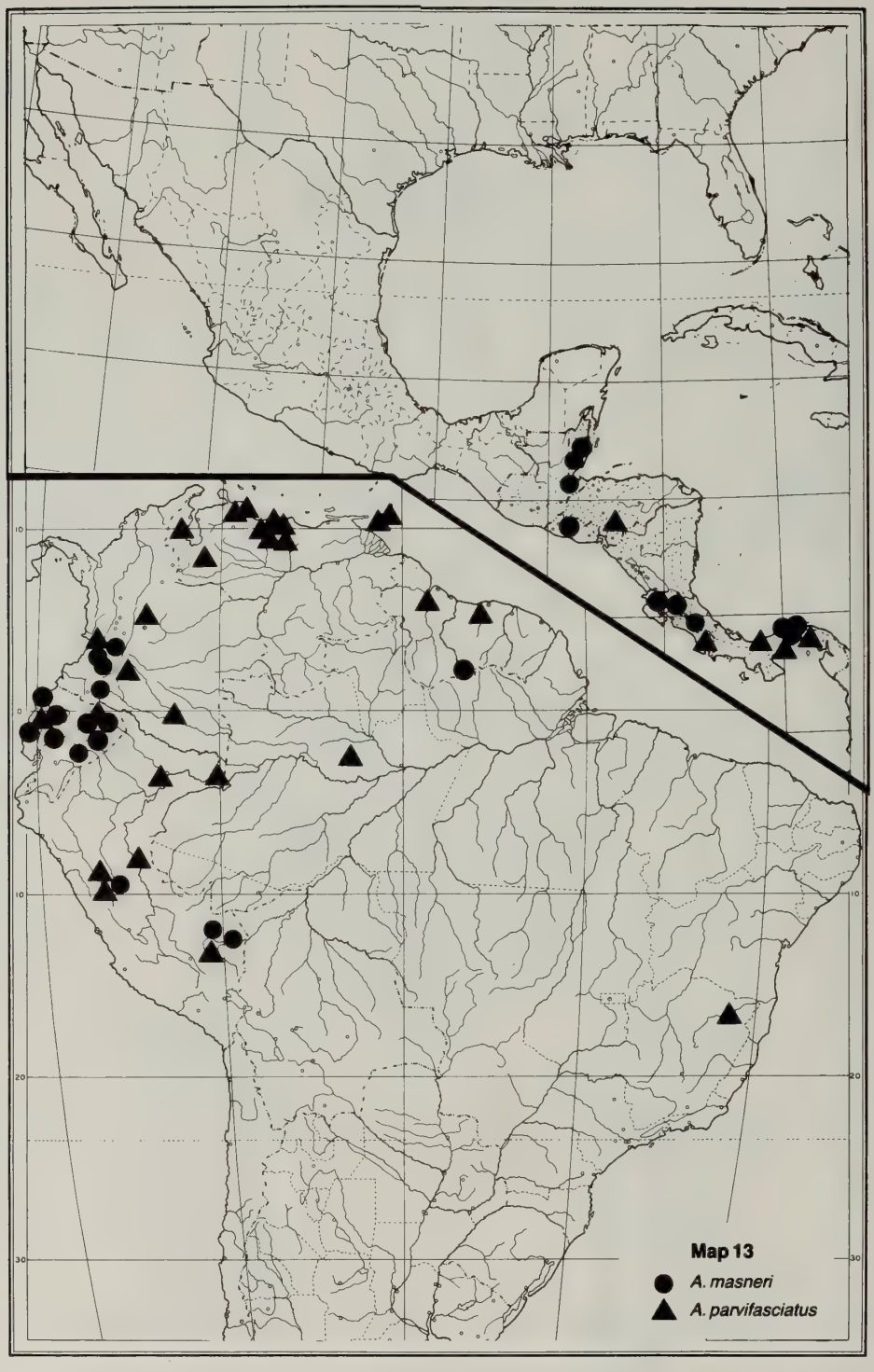
A. ixtilton
A. nio
A. cora
A. voto


Map 11
A. misa
A. oyana
A. uchukqepi
A. jatunqepi
A. suni
A. triangulifer
A. pisipuka
A. paruyana
A. yanamapa
WEST LONGITUDE


Map 12
A. leptosoma
A. waiwai
A. porteri
A. aymara
A. uchuk
A. festivus
A. paqo
A. llampu
A. plaumanni
WEST LONGITUDE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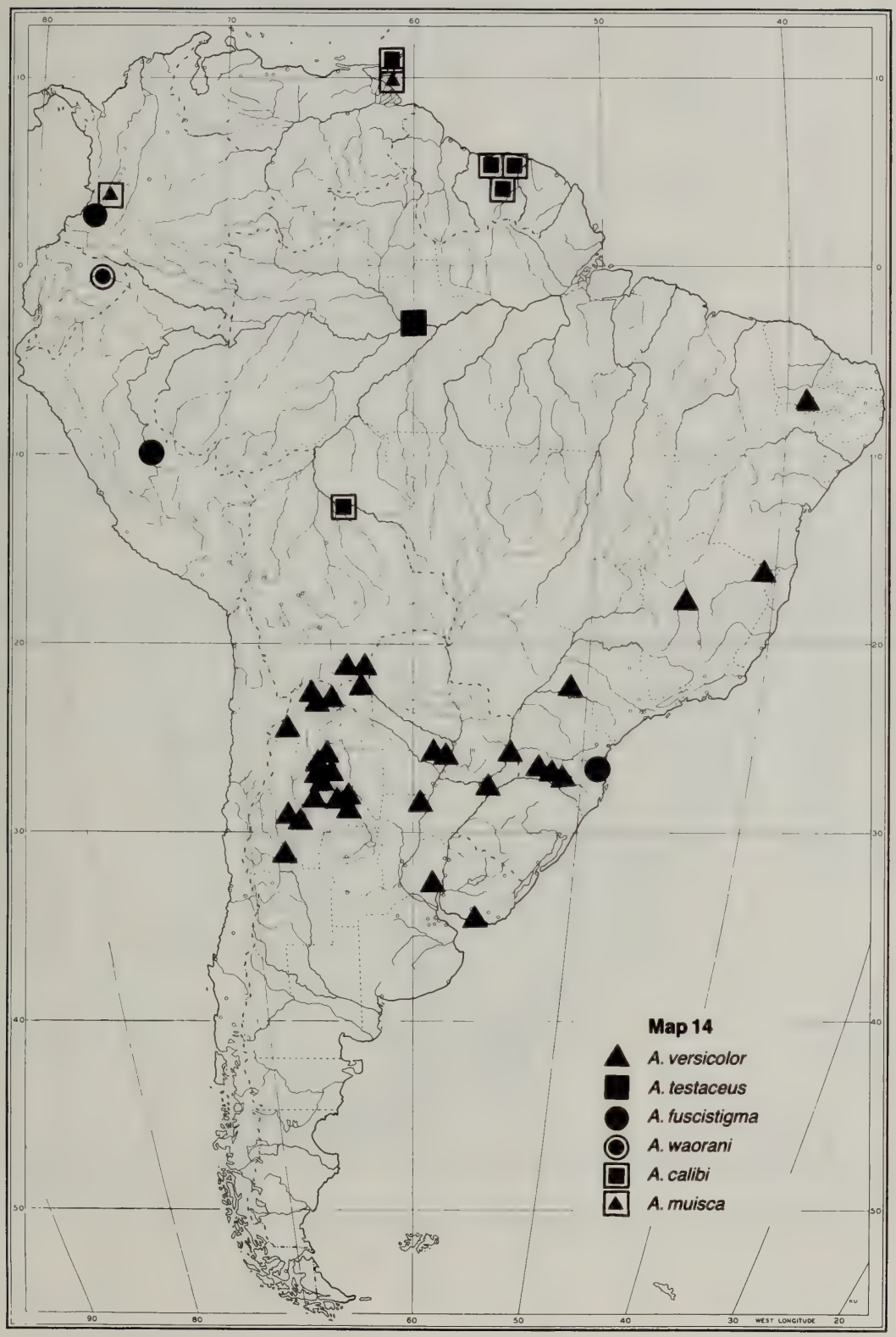
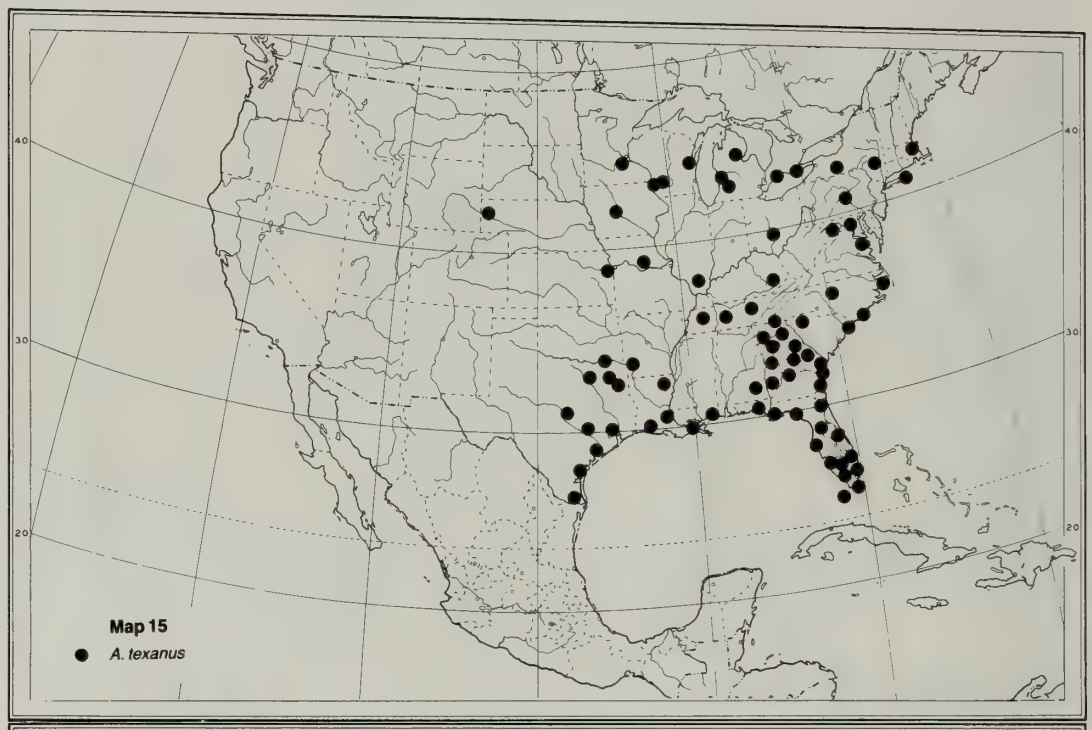
A. masneri
A. parvifasciatus


Map 14
A. versicolor
A. testaceus
A. fuscistigma
A. waorani
A. calibi
A. muisca
WEST LONGITUDE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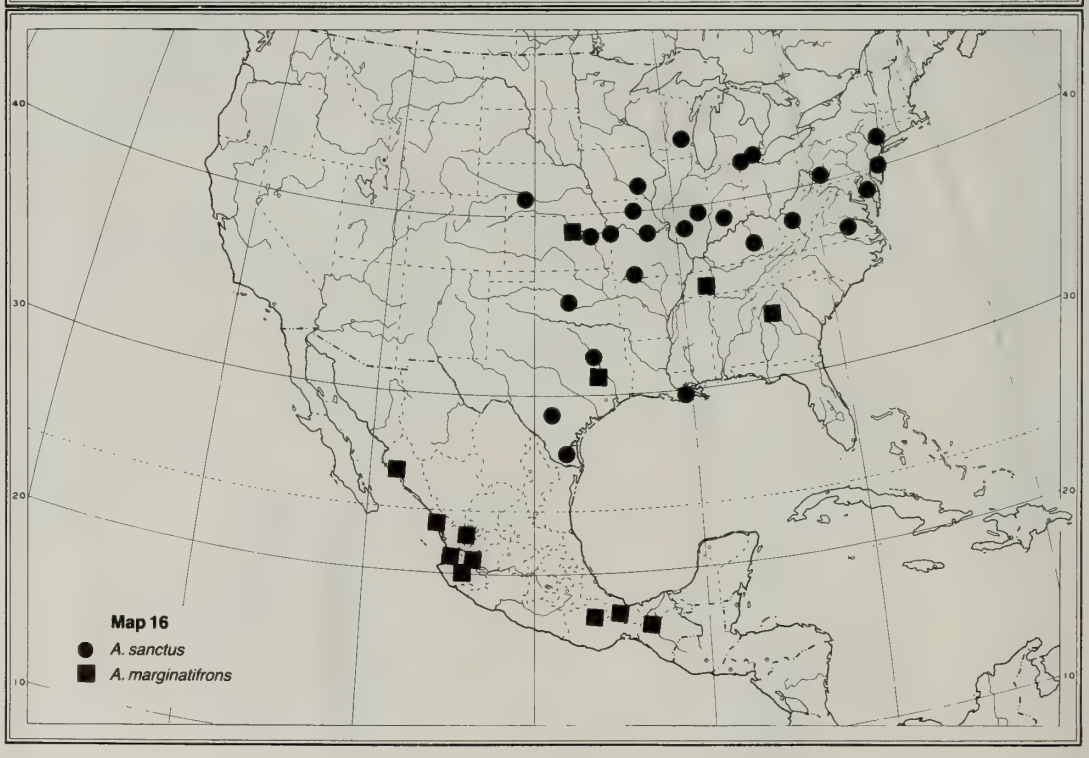
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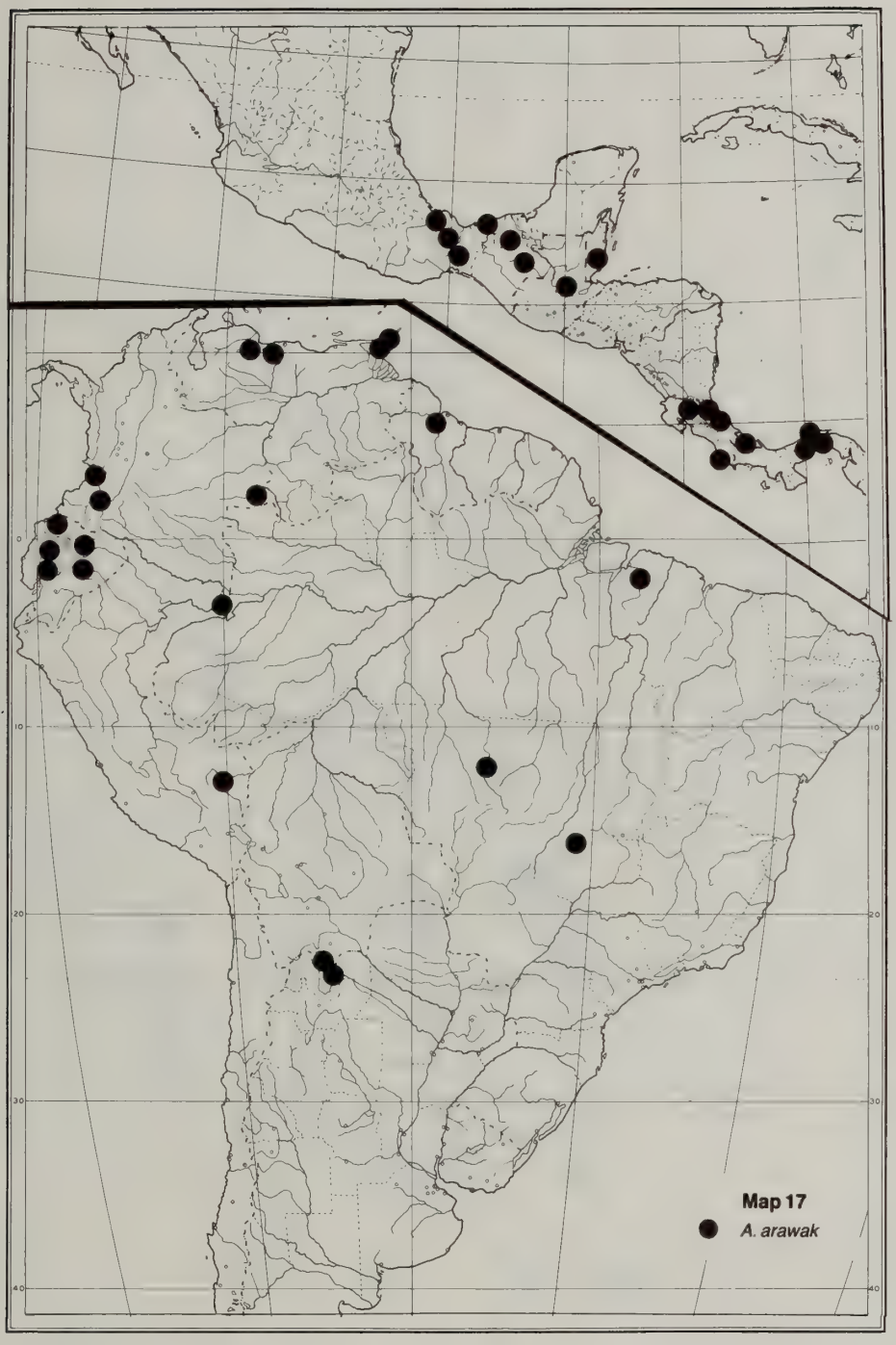
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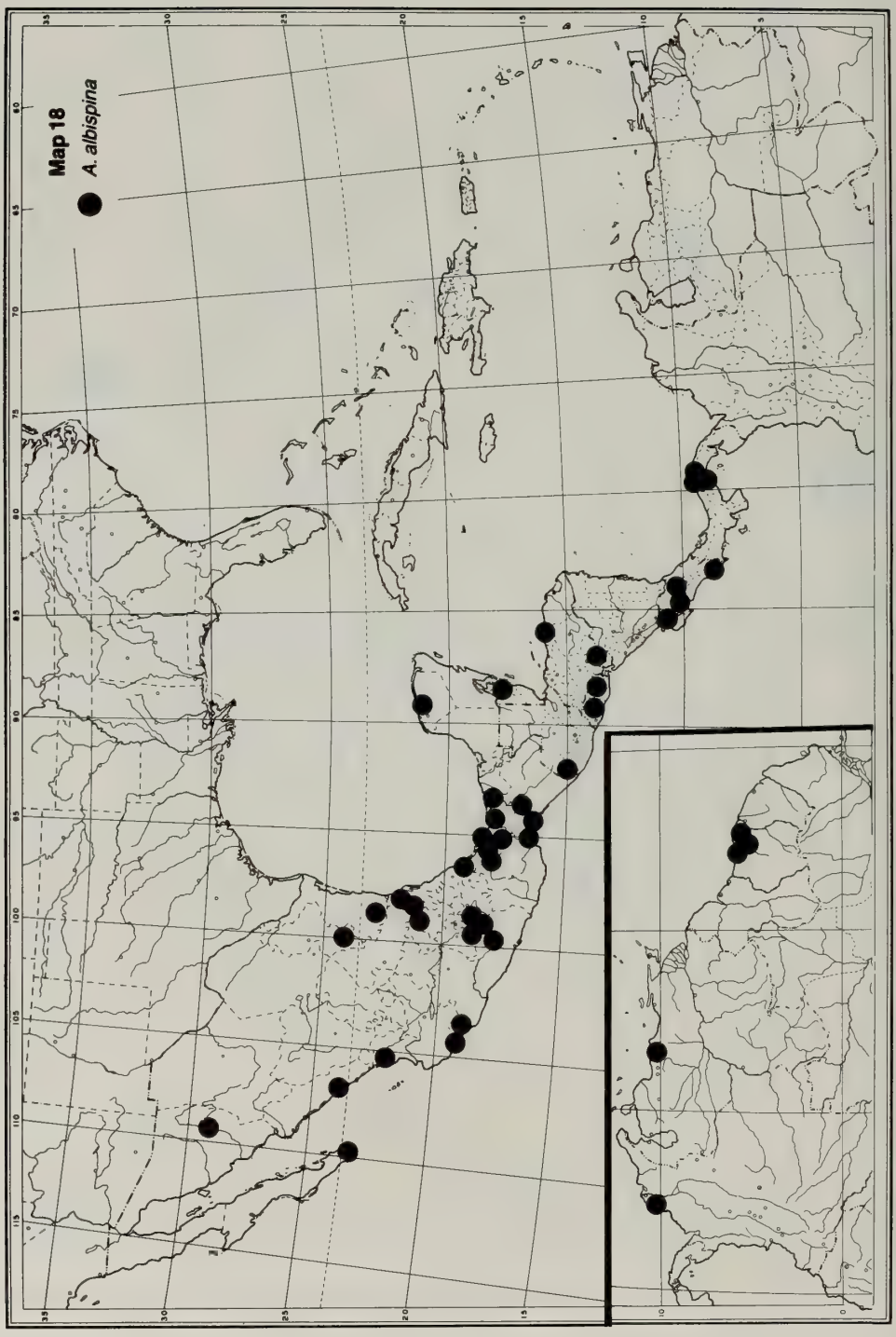
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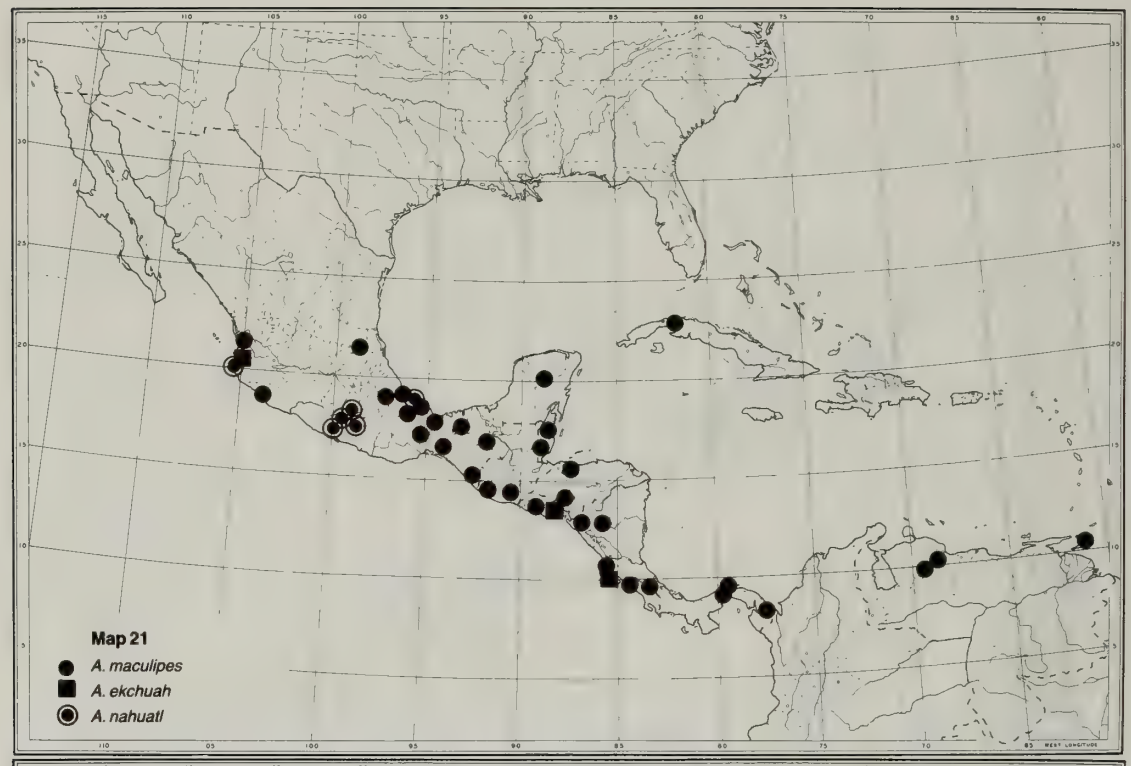
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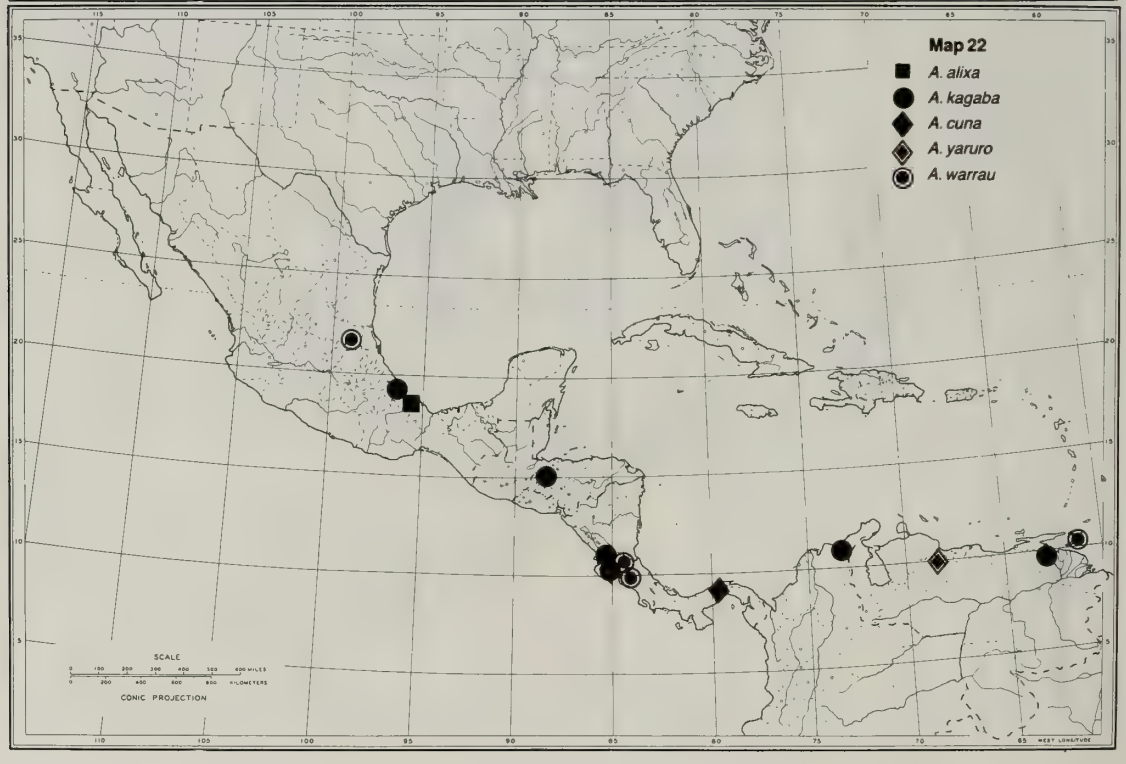
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