CLASSIFICATION AND REVISION OF WORLD SPECIES OF THE GENUS

FUSICORNIA RISBEC (HYMENOPTERA: PLATYGASTRIDAE)

MASTER’S THESIS

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By

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Abstract

The genus *Fusicornia* Risbec (Hymenoptera: Platygastridea, Platygastridae) is a widespread group in the Old World, distributed from West Africa to Vanuatu. All scelionids are egg parasitoids of arthropods, but the host of *Fusicornia* is not yet known. The species concepts are revised and a key to world species is presented. The genus comprises 19 species of which five are redescribed: *F. bambeyi* Risbec (sub-Saharan Africa, Madagascar, Yemen); *F. indica* Mani & Sharma (Australia, India, Philippines, Sri Lanka, Thailand); *F. koreica* Choi & Kozlov (Japan, Korea, Philippines, Taiwan); *F. spinosa* (Risbec) (sub-Saharan Africa, Saudi Arabia, Yemen); and *F. tehrii* Mukerjee (Brunei, Indonesia, Japan, Laos, Malaysia, Papua New Guinea, Philippines, Sri Lanka, Taiwan, Thailand). *Fusicornia noonae* Buhl is considered to be a junior synonym of *F. tehrii* Mukerjee, n. syn. The following species are hypothesized and described as new taxa: *F. ardis* Taekul & Johnson, n.sp. (West Africa and Kenya); *F. aulacis* Taekul & Johnson, n.sp. (Madagascar); *F. collaris* Taekul & Johnson, n.sp. (New Guinea); *F. crista* Taekul & Johnson, n.sp. (Somalia); *F. dissita* Taekul & Johnson, n.sp. (Vanuatu); *F. eos* Taekul & Johnson, n.sp. (West Africa, Yemen); *F. episcopus* Taekul & Johnson, n.sp. (Thailand); *F. fax* Taekul & Johnson, n.sp. (Papua New Guinea); *F. fortuna* Taekul & Johnson, n.sp. (Madagascar, Yemen); *F. paradisa* Taekul & Johnson, n.sp. (sub-Saharan Africa, Madagascar); *F. plicata*, n.sp. (Sri Lanka); *F. skopelos* Taekul &
Johnson, *n.sp.* (Madagascar); *F. sabrina* Taekul & Johnson, *n.sp.* (Somalia) and *F. speculum* Taekul & Johnson, *n.sp.* (Madagascar, Nigeria, Uganda).
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CHAPTER 1

INTRODUCTION

Recognition and description of species is very important to science as the first step to maintain and continue to benefit from our planet’s biodiversity. It is the most vital role of taxonomy. In order to fully comprehend the threat of the biodiversity crisis and to explore and document the species diversity of our planet, it is time to approach taxonomy as large-scale international science (Wheeler et al. 2004). As in the recent National Science Foundation Planetary Biodiversity Inventories, studies of species-rich taxa need to be facilitated all around the globe. The research reported here is focused on the taxonomy of one small genus in family Platygastridae: Fusicornia Risbec.

In this chapter, I review three separate topics relevant to naming organisms in a systematic strategy. First, I discuss the relationships of describing species and systematics. In addition, the value of systematics to the well-being of the planet has been reviewed. In the second section, the importance of describing species of genus Fusicornia the impediments to taxonomic progress, and research objectives will be discussed. Last, I review and discuss the superfamily Platygaстроidea and the family Platygastridae, including taxonomic history, fossils, biology, and geographical distribution.
1.1 THE VALUE OF SYSTEMATICS AND DESCRIBING SPECIES

Systematics is the science dealing with the study of biological diversity and of the evolutionary relationships among organisms (Winston 1999). As a subdivision of systematics, taxonomy is the practice of discovery, description, and naming of life forms and arranging them in classifications (Novacek 1992). Taxonomic nomenclature provides the language both for systematics and for all of biology. Taxonomic procedure is the practical process of identifying, recognizing, researching, and describing a taxon in a scientific publication, adhering to the current rules of biological nomenclature (Winston 1999). These tasks result in a better understanding of the diversity of species in the world. The pattern of relationships among these species, the result of systematic investigation, is generated by evolutionary processes such as speciation, extinction, and hybridization. Thus, understanding of evolution is both informed and constrained by taxonomy.

On a catastrophically short timescale, an unprecedented massive degradation of habitat and extinction of much of the Earth’s biota is taking place (Novacek 2001). Extinction is estimated to approach 30% of all species by the mid 21st century, an event that would be comparable to some of the calamitous mass extinction events of the past (Sepkoski 1992; Erwin 1993; Novacek and Cleland 2001). One of the major threats to species diversity is the current rate of rainforest destruction (Myers 1988). Additionally, biotic homogenization results from the decline of many species as a result of human activities and their replacement by non-indigenous species, usually introduced by humans (McKinney and Lockwood 1999).
The total array of the Earth’s biological diversity will probably never be fully known. Species and whole communities are being lost even before they can be identified, and the richness of the planet is constantly and irreversibly diminished (Eldredge 2000). The possibility of recovery or maintenance of the biota is impeded by insufficient information on the diversity and distribution of species, ecological processes, and the magnitude and interaction of threats to biodiversity such as pollution, overharvesting, climate change, disruption of biogeochemical cycles, introduced or invasive species, habitat loss and fragmentation through land use, disruption of community structure in habitats, and others (Novacek 2001).

The Earth’s biological diversity crisis is the principal reason why it is essential to know and understand evolutionary relationships and the classification of diverse species and the groups that contain them. Not merely do human beings need to be responsible for the biodiversity crisis, but they also hold the key to preventing an impending mass extinction (Eldredge 2000).

To succeed in any restoration or recovery practice, vastly improved information on the basic state of the world biota remains a profoundly important goal for the conservation of biodiversity. Patterns of species diversity and endemism critical to identifying hotspots or other conservation priorities are the products of work by experts in systematic biology (Novacek 2001). Thus, in conserving biological diversity an understanding of the geographic and phylogenetic distribution of species richness is indispensable.
A large number of new species presently are being discovered and described. Explorations of new regions or habitats, new collecting techniques, and new technologies have led to a dramatic increase in the number of species described for many groups of organisms (Winston 1999). This contributes to the recognition of which species exist in particular places and their ecological roles. This diversity is not only valuable in its own right, but also may be of great benefit to human beings.

“Until you know what grows and lives in a particular place, and recognize its position in the biosphere, you can neither exploit nor conserve those biological resources properly” (Galloway 1988; Winston 1999). Biological control is one of the significant forms of beneficial exploitation of natural resources. The U.S. Environmental Protection Agency’s (EPA) 2006-2011 Strategic Plan has as a key component of Goal 4 the identification, assessment, and reduction of the risks presented by the thousands of chemicals and pesticides on which our society and economy have come to depend (EPA 2006). A principal strategy involved in reducing the use of chemicals and pesticides is to substitute these materials by biological control agents. These have been considered to be economically important in controlling population of pests of agriculture and forestry as well as vectors of human and animal disease. Parasitic Hymenoptera, the subject of this research, include many of the best examples of biological control. These natural enemies, in their role of biological control agents of hosts, may be critical keystone species (LaSalle 1993).
1.2 RESEARCH IMPEDIMENTS AND THESIS OBJECTIVES

Comprising approximately 115,000 described species (Sharkey 2007), the order Hymenoptera has been placed behind the Coleoptera and Lepidoptera in term of species richness. Some hymenopterists argue, nevertheless, if undescribed species were included, the Hymenoptera would be more species-rich than all other orders (Grissell 1999; Sharkey 2007). The order Hymenoptera is traditionally divided into two suborders: the Symphyta, comprising the phytophagous sawflies and horntails, and the Apocrita, including bees, ants, and wasps. Within Hymenoptera, the diversity of Apocrita is greater than Symphyta. Based on most published reports, species richness of Symphyta is possibly much greater in the tropics and subtropics than in the temperate regions (Sharkey 2007). The order is probably the most beneficial in the entire insect class (Triplehorn and Johnson 2005). It contains a great many species that are of value as parasitoids or predators of insect pests, and comprises important pollinators of plants. The biology of the Hymenoptera is very interesting, as they exhibit a diversity of habits and complexity of behavior culminating in the eusocial organization of the wasps, bees, and ants. In addition, parasitic Hymenoptera play a vital role in using other insects as hosts, consuming them for nourishment, and in the end killing them. This interesting life-history strategy is called parasitism. Within the order Hymenoptera, parasitoids are found in more than 50% the superfamilies currently recognized. Some of these are familiar groups, e.g., the Ichneumonoidea (more than 30,000 described species) and the Chalcidoidea (more than 20,000 described species). As the significant egg parasitoid group, the Platygastridea is the third largest of the parasitic superfamilies after the Ichneumonoidea.
and Chalcidoidea and represents more than 5147 described species worldwide (Johnson 2008). The focus of this project is one of the genera in superfamily Platygastroidea: *Fusicornia* Risbec, which is comprised of 6 known species and 14 new species.

In the 58 years since its description, *Fusicornia* has never been comprehensively reviewed or revised. The place of the genus was not addressed in the study of phylogeny and evolutionary relationships of platygastroid wasps (Murphy et al. 2007). There are two important areas that hinder taxonomic progress with *Fusicornia*: character variability and the lack of knowledge of the host. Some species in the genus are widely distributed and highly variable in terms of color and geographical distribution. Conversely, closely related species often are extremely similar. The only known hosts of parasitic wasps of the family Scelionidae are the eggs of insects and spiders (Austin, Johnson and Dowton 2005). No hosts are yet known for any species of *Fusicornia*. Such biological knowledge could help to develop and test species hypotheses. It can provide a lower bound of intraspecific variation of morphological characters. In addition, reared material can be very valuable in associating the two sexes.

The goal in this paper is to present a systematic revision of the genus *Fusicornia*. The taxonomic history of the genus is summarized and existing concepts are reviewed. The identification key to the species is presented. Fourteen new species are proposed on the basis of substantially increased collections, twice the number of described species-group taxa. The placement of *Fusicornia* within the family is outside the scope of this contribution and is the subject of an ongoing combined morphological and molecular analysis.
1.3 SUPERFAMILY PLATYGASTROIDEA

1.3.1 Taxonomic History

The first species now classified in superfamily Platygastroidea was published in the tenth edition of Linnaeus’s Systema Naturae in 1758. In the book he proposed the name, *Ichneumon ovulorum*, which is actually a species of *Telenomus* reared from lepidopteran eggs (Linnaeus 1758). Genera currently recognized as platygastroids were typically placed within the superfamily Proctotrupoidea, also sometimes referred to as Serphoidea or Oxyura. The family-group name Proctotrupii was originally proposed by Latreille (1802), and the first platygastroid genera to be placed within it were *Scelio*, *Sparasion* (Latreille 1805), and *Teleas* (Latreille 1809). The family group name Platygastridae (as Platygastres) was originally proposed by Haliday (1833), and Scelionidae also by Haliday (1839). These two concepts, sometimes treated separately, sometimes with platygastrids within the Scelionidae, remained grouped within the heterogeneous Proctotrupoidea until the second half of the 20th century. Masner (1956) suggested that the two families should be treated as a separate superfamily, the Scelionoidea, a name later changed to Platygastroidea in recognition of the latter’s priority. A brief summary of family-group names used for subfamilies and families is presented in Table 1. Recently, Sharkey (2007) has combined the families Scelionidae and Platygastridae under the single family Platygastridae. The reasons for the synonymy are (1) the absence of synapomorphies, defining the scelionids as a monophyletic group, a conclusion based on the phylogenetic analysis of Murphy et al. (2007); and (2) Sharkey’s perception that the superfamily is morphologically homogeneous. In this
paper, the rank and monophyly of the previously recognized subfamilies were not discussed. Thus, the review of literature here will discuss Platygastrinae, Sceliotrachelinae, Scelioninae, Teleasinae, and Telenominae, all as subfamilies of Platygastridae.

1.3.2 Diversity and Geographic Distribution

The Platygastroidea is the third largest parasitoid superfamily after the Ichneumonoidea and Chacidoidea (Austin et al., 2005). The superfamily is placed as a monophyletic group with Prototrupoidea and Cynipoidea (Sharkey 2007). The former two families, Platygastridae and Scelionidae were catalogued (Johnson 1992, Vlug 1995) and the taxonomic information is kept updated in Johnson (2008). Currently, 244 genera and 5,147 species of Platygastroidea are considered to be valid: i.e., Platygastrinae (43 genera, 1335 species), Sceliotrachelinae (26 genera, 108 species), Scelioninae (145 genera, 2,365 species), Teleasinae (12 genera, 481 species), and Telenominae (18 genera, 858 species).

The geographic coverage of superfamily is fairly thorough in both Old World and New World. With several recent studies of the relative scale of platygastroid diversity, the areas that remain largely unstudied are tropical and southern continents (Austin et al. 2005). There appears to be little overlap in species composition, indicating a high level of regional endemism (Iqbal and Austin 1997).
1.3.3 Fossil Taxa

Most described fossils of the superfamily Platygastridea are from Baltic amber inclusions. Grimaldi and Engel (2005) claimed it to be the dominant group of Hymenoptera in the Cretaceous, and that the superfamily was probably had its greatest diversity during the Cretaceous, dwindling during the Cenozoic. In fact, merely 5 species have been so far described from the Cretaceous period, and the number of platygastrid fossil species dramatically increased after the Paleocene epoch, based on the list of fossil and subfossils species of Platygastridea by Johnson et al. (2008). The platygastrid fossil and subfossils are represented based on geological periods from Grimaldi and Engel (2005); 5 genera in Cretaceous, 1 genus in Paleocene, 23 genera in Eocene, 4 genera in Oligocene, and 4 genera in Miocene (Johnson et al. 2008).

1.3.4 Monophyly of the Superfamily

The potential evidence which supports monophyly of Platygastridea is the modified structure and function of the abdomen and ovipositor, and the paired basiconic sensilla on the apical segments of the female antenna. The function of ovipositor in plastygastroids is complex. Unlike most other parasitic hymenoptera, the proximal elements of ovipositors, i.e., gonocoxae, and gonapophyses, are disassociated from the posterior segment of the abdomen. (Quicke et al. 1999; Vilhelmsen 2003; Austin et al. 2005). The general character of plastygastrid wasp comprises the body length from 0.5 to 12 mm., but most are less than 2.5 mm. In comparison with other parasitic wasps, most have greatly reduced wing venation, the antennae are inserted close together just above
the mouth, they lack a prepectus behind the lateral pronotum, and are well sclerotized and often intricately sculptured. Platygastrinae and Sceliotrachelinae are commonly distinguished from other subfamilies by the length of metasomal segment 2 usually shorter; fore wings with at most a single tubular vein; and the smaller number of antennomeres, usually 7-10. Scelioninae, Teleasinae, and Telenominae, in contrast, represent different characters: the fore wing venation is somewhat more elaborate, consisting of the submarginal, marginal, stigmal and postmarginal veins; the metasomal tergum 2 is at most usually slightly longer than tergum 3; and the antenna usually has 11-12 antennomeres (Masner, in Goulet and Huber, 1993).

1.3.5 The Biology of Platygastroidea

Predation and parasitism are two antagonistic ecological interactions in which one species takes advantage of another species. A predator is an organism that kills and eats another, its prey. Parasites consume nourishment from another organism which typically results in some harm to the host, but not death. Parasitoids, generally in their immature stages, feed on only a single “host”, but in the process kill it (Triplehorn and Johnson 2005).

A number of families within parasitic Hymenoptera are egg parasitoids of pests of agriculture and forestry as well as of vectors of human and animal disease. Numerous groups of Chalcidoidea are egg parasitoids e.g., the Trichogrammatidae and Mymaridae, known for wide host ranges (Huber 1986, Nagarkatti 1977). These organisms are
important keystone species in their role of biological control agents (Lasalle 1993). 

Austin et al. (2005) stated that all subfamily Scelioninae, Teleasinae, and Telenominae are endoparasitoids of the eggs of insects and spiders (Table 2). The authors believed this to be the ground plan biology for the superfamily. In addition to parasitizing host eggs, Platygastrinae and Sceliotrachelinae, also attack later stages of sessile hosts e.g., planthoppers, whiteflies, and aphids. Most species, however, parasitize gall flies (Diptera: Cecidomyiidae), either in the egg or early larva of the host (Table 3).

With their hypodermic-like ovipositor, female scelionids pierce the chorion of a host egg and lay their own single egg, or sometimes several eggs within. The wasp larva that hatches derives its nourishment from the host egg and pupates within it. The hosts of the family comprise the Odonata, Orthoptera, Mantodea, Embiidina, Hemiptera, Neuroptera, Coleoptera, Diptera, Lepidoptera and spiders (Austin and Field 1997, Masner 1976; Austin et al. 2005).

Despite the lack of complete knowledge of the diversity of taxa within this group, scelionid wasps are proven to be potential biological control agents (Orr 1988). This is attributed to several characteristics, including high searching abilities and reproductive rates, lack of hyperparasitoids, synchrony with host populations, positive host-density responsiveness, simple adult diets, and they can be reared easily. Although only 30 species have been used in classical biological control attempts, several of these have produced excellent results (Orr 1988). As biological control agents, scelionid wasps can be applied to all biological control practices, including classical control, conservation,
and augmentation (Table 4). Because scelionids parasitize the eggs of insect pests, they are very useful with other management tactics such as integrated pest management and conservation practice.
### Platygastridae

<table>
<thead>
<tr>
<th>Platygastridae</th>
<th>Teleaidea Walker, 1836</th>
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<tr>
<td>Platygastres Haliday, 1833</td>
<td>Scelionidae Haliday, 1839</td>
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<td><strong>Sparasionidae Dahlbom, 1858</strong></td>
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<td>Scelionini Thomson, 1859</td>
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<td><strong>Muscidides Motschoulsky, 1863</strong></td>
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<td>Platygastrides Desmarest, 1860</td>
<td>Scelioninae Howard, 1886</td>
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<td>Platygastridera Walker 1873</td>
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<tr>
<td>Platygastrinae Howard, 1886</td>
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</tr>
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<td>Platygastrinae Morley, 1923</td>
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<td>Platygastrini Jansson, 1939</td>
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<table>
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<tr>
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<tr>
<td>Sceliotrachelinae, Brues, 1908</td>
<td>Baeini Ashmead 1893</td>
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<td>Amitini Szabó, 1959</td>
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<td>Platygastrinae</td>
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<td>Platygastrerini Ashmead, 1893</td>
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<td>Platygastrinae Ashmead, 1903</td>
<td>Scelioniniens Risbec, 1950</td>
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<td>Baeini Ashmead 1903</td>
</tr>
<tr>
<td>Platygastrerini Ashmead, 1893</td>
<td>Scelioniniens Risbec, 1950</td>
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<tr>
<td>Platygastrinae Ashmead, 1903</td>
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### Table 1: The valid synonymies of the family Platygastridae and its inner taxa, Sceliotrachelinae, Platygastrinae, Scelioninae, Teleasinae, and Telenominae (the bold text indicates an original description)
<table>
<thead>
<tr>
<th>Kozlov 1970</th>
<th>Masner 1976</th>
<th>Austin &amp; Field 1997</th>
<th>Host groups (based on type genera)</th>
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<td>Baeini</td>
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<td><strong>Telenominae</strong></td>
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</table>

Table 2: The relationship between subfamily Scelioninae, Teleasinae, and Telenominae, and associated host groups (Austin et al. 2005)
<table>
<thead>
<tr>
<th>Kozlov 1970</th>
<th>Masner &amp; Huggert 1989</th>
<th>Austin &amp; Field 1997</th>
<th>Host groups (based on type genera)</th>
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<tr>
<td>Sceliotrachelinae</td>
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<td><em>Amitus</em>-cluster</td>
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Table 3: The relationship between subfamilies Sceliotrachelinae and Platygastroinae and associated host groups (Austin et al. 2005)
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<tr>
<th>Successful Classical biological control</th>
<th>Augmentation biological control</th>
<th>Conservation biological control</th>
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</thead>
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<tr>
<td><em>Trissolcus basalis</em></td>
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<td><em>Trissolcus grandis</em></td>
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<td><em>Psix lacunatus</em></td>
<td><em>Telenomus olsenni</em></td>
<td><em>Telenomus sechellensis</em></td>
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</tbody>
</table>

Table 4: The application of platygastroid wasps in biological control approach (Orr 1988)
CHAPTER 2
MATERIALS AND METHODS

2.1 Materials

This work is based upon specimens in the following collections, with abbreviations used in the text;

- **ANIC** Australian National Insect Collection, Australia
- **BPBM** Bernice P. Bishop Museum, Honolulu, HI
- **CASC** California Academy of Sciences, San Francisco, CA
- **CNCI** Canadian National Collection of Insects, Ottawa, Canada
- **MZLU** Lund University, Lund, Sweden
- **OSUC** Ohio State University Insect Collection, Columbus, OH
- **SAMC** South African Museum, Cape Town, South Africa
- **SANC** South African National Collection of Insects, South Africa
- **TARI** Taiwan Agricultural Research Institute in Taichung, Taiwan
- **UCRC** University of California Riverside, California, CA
- **USNM** National Museum of Natural History, Washington, DC
2.2 Morhological Terminology and Data Handling

Abbreviations and morphological terms used in text: A1, A2, ... A12: antennomere 1, 2, ..., 12; Ar1, Ar2, ..., Ar 5: separated area on metapleuron (Figs. 1A, B); claval formula: distribution of the large, multiporous basiconic sensilla on the underside of apical antennomeres of the female, with the segment interval specified followed by the number of sensilla per segment (Bin 1981); OOL: ocular ocellar line, the shortest distance from inner orbit and outer margin of lateral ocellus (Masner and Huggert 1989); T1, T2, ..., T7: metasomal tergite 1, 2, ..., 7. Morphological terminology generally follows Masner (1980) and Mikó et al. (2007).

This study involves 231 specimens from the Triplehorn Insect Collection, The Ohio State University, and 641 specimens borrowed from other institutions around the world. In the Material Examined the numbers prefixed with “OSUC” and “CASENT” are unique identifiers for the individual specimens. Since the label data for all specimens have been georeferenced and recorded in the Hymenoptera On-Line database, details on the data associated with these specimens can be accessed at the following link, purl.oclc.org/NET/hymenoptera/hol, and entering the identifier in the form. Note the space between the acronym and the number.

Biodiversity informatics tools facilitated the work of this project. Data associated with specimens can be accessed at http://purl.oclc.org/NET/hymenoptera/hol?id=485. In order to generate the species descriptions a database application, vSysLab (purl.oclc.org/NET/hymenoptera/vSysLab), was designed to facilitate the generation of a
taxon by data matrix, and to integrate this with the existing taxonomic and specimen-level database. Data are exported in both text format and as input files for other applications. The text output for descriptions is in the format of “Character: Character state (s). Images were made using AutoMontage and Cartograph extended-focus software and are archived with Specimage (purl.oclc.org/NET/hymenoptera/Specimage) and Morphbank (www.morphbank.net).
CHAPTER 3

GENUS FUSICORNIA RISBEC

(HYMENOPTERA: PLATYGASTRIDAE: SCELIONINAE)

3.1 Taxonomic History

The genus *Fusicornia* was originally described by Jean Risbec (1950), based on a single female specimen collected from M'bambey, Sénégal, assigned to the species, *F. bambeyi*. Risbec (1957) subsequently described an additional variety, *inermis*, on the basis of another single female specimen from M’Boro, Sénégal. Masner (1976) transferred *Procacus spinosus* (Risbec 1953) to *Fusicornia spinosa*. To date, seven species-group taxa have been described, and published records document the distribution of the genus from West Africa east to Australia, and north to the Korean peninsula. The recognized species of *Fusicornia* are: *F. bambeyi* Risbec and *F. spinosa* (Risbec) from Africa; *F. indica* Mani & Sharma 1980, *F. tehrii* Mukerjee 1993 and *F. noonae* Buhl 1998 described from the Oriental region; and *F. koreica* Choi & Kozlov, 2001 from the Palearctic realm. *Fusicornia* remained unplaced within the subfamily Scelioninae until Masner (1976) placed it within the tribe Psilanteridini. Austin & Field (1997) examined
the ovipositor structure and concluded that the genus was misplaced within that tribe. They did not, however, provide an alternate classification.

3.2 Reviews


3.3 Diagnosis

Masner (1976) and Galloway & Austin (1984) both compared *Fusicornia* directly with *Opisthacantha* Ashmead. The two are similar in the armed metascutellum, the lack of a margined frontal scrobe, and a well-developed postmarginal vein. *Opisthacantha sensu stricto* is not closely related: it is easily distinguished by the presence of a skaphion and the female has a well-defined 5-merous antennal clava. The concept of *Opisthacantha* of Masner (1976) encompasses a number of heterogeneous elements, some of which lack the skaphion. From these, *Fusicornia* may be distinguished by the elongate and poorly defined female antennal clava (Figs. 3B, 5B, 6B), and the very elongate marginal vein of the fore wing.
Masner (1976) and Choi & Kozlov (2001) compared *Fusicornia* with some species of the genus *Trimorus*, specifically the *T. ninus* group. Both taxa have the combination of a shining body surface shining and sometimes dense fields of silvery pubescence, along with the elongate marginal vein. Otherwise, they are quite different: *Fusicornia* is distinguished by the presence of a postmarginal vein, POL > OOL, the netrion is broad, the clypeus is strongly transverse, and the mandibles are always bidentate.

### 3.4 Geographical Distribution

*Fusicornia* is primarily a tropical group of Africa, Asia, and Australasia, extending into the temperate zones only in southern Africa, Korea, and Japan. The genus is most diverse in the Afrotropical region, particularly in West Africa. Some species are quite widespread, e.g., *F. bambeyi*, *F. paradisa*. *Fusicornia aulacis* appears to be endemic to Madagascar; although other taxa seem to be restricted in distribution (e.g., the species in New Guinea), the data are insufficient to confidently state that they are endemic to that island.

### 3.5 Character Description

Moderate-sized, female body length 1.51-2.76 mm, male body length 1.57-2.57 mm; body moderately elongate, fairly slender, antenna with well developed clava, moderately elongate; body dark brown to black; body sculpture mostly smooth and shining.
Head in dorsal view of female upper gena flat to weakly concave, therefore in lateral view compound eye appearing to reach posterior margin of head, expanded, convex, therefore in lateral view compound eye separated from posterior margin by gena; vertex between posterior ocelli carinate or rounded; female OOL equal or less than an ocellar diameter, wider than one ocellar diameter. Frontal sculpture, at least partly smooth or considerably effaced, entirely and evenly sculptured; inner orbit in frontal view more or less parallel converging dorsally; sculpture of central frons with transversely arcuate striae, reticulate-punctate, smooth or with shallowly impressed reticulate microsculpture, punctate; sculpture of gena behind lower half of eye, smooth, with reticulate to coriaceous microsculpture; setation of central frons, glabrous, moderately setose throughout, with dense, decumbent silvery setae; setation of gena, very densely setose, sparsely setose, moderately setose; claval color dark brown to black, bright yellow; claval formula (A12-A7), 1-2-2-2-2-2, 1-2-2-2-2-1, 1-2-2-2-2; color of female A1, yellow to orange-brown, dark brown to black; color of female A5, bright yellow, dark brown or black, yellow, dark brown to black apically; radical color, yellow to orange brown, dark brown to black, bright yellow.

Mesosoma, admedian line present, absent area 2 on metapleuron linear setose, polygonal setose, linear, glabrous; length of lateral metanotal spine very short only slightly longer than wide, moderately elongate, length distinctly greater than width; length of medial metanotal spine medial spine very elongate distinctly longer than distance between median and lateral spines, medial spine short to moderately long, as long as distance between median and lateral spines, medial spine short to moderately long.
distinctly shorter than distance between medial and lateral spines; longitudinal sculpture in posterior half of mesoscutum present, absent; mesepimeral sulcus absent, abbreviated, complete, foveate throughout, complete or briefly interrupted, foveate above, appearing as fold ventrally; mesopleural carina complete, absent, present dorsally interrupted or absent ventrally; mesoscutal humeral sulcus coarsely crenulate, very coarsely foveolate, smooth, foveolate; mesoscutum sculpture longitudinal sculpture throughout, smooth and shining, densely coriaceous, reticulate, reticulate with superimposed punctures; netrion setation densely setose, sparsely setose to glabrous; notauli absent, present, indicated by short groove on posterior mesonotum; pronotal cervical sulcus present, absent; sculpture in lower pronotum longitudinally striate, reticulate to weakly rugulose; sculpture of nucha, smooth to weakly sculptured, strongly foveolate to longitudinally striate; sculpture of scutellum almost entirely covered by microsculpture, almost entirely smooth, with broad smooth area medially, reticulate-punctate laterally; sculpture of suprahumeral area of pronotum puncticulate, smooth, postulate, densely punctate; scutellum shape bilobate, rounded, weakly emarginated; setation fo propodeum anterior to spiracle, densely setose (more than 10), sparsely setose (setation less than 10) or absent; setation in anteroventral metapleural triangle present, absent; setation of area 4 of metapleuron setose nearly throughout, setose ventrally, glabrous; coxae color all coxae brown to black, all coxae yellow, fore coxa brown, mid and hind coxa yellow; female fore wing maculation hyaline or with slight infuscation below marginal vein, with distinct infuscation at level of marginal vein.
Metasoma horn on T1 of female, present as low elevation, sculpture on horn variable absent, T1 longitudinally furrowed throughout length, well developed, sculpture on horn very weak or absent; lateral setation of T1, densely setose (setation more than 20/side), sparsely to moderately setose (setation 6-15/side); length of T1, less than or equal to one times width, equal or more than 1.4 times width; medial sculpture on T3, smooth and shiny, shallowly longitudinal rugulose and reticulate.

3.6 Key to species of Fusicornia

Males (unknown for F. collaris, F. crista, F. dissita, F. episcopus, F. fax, F. plicata, and F. sabrina)

1. Frons entirely and evenly sculptured (Figs. 4E, 5E, 6E, 8E); sculpture of gena behind lower half of eye with reticulate to coriaceous microsculpture (Fig. 1E)

................................................................................................................................................................. 2

– Frons at least partly smooth or sculpture considerably effaced medially (Figs. 7E, 9E, 12E, 25E); sculpture of gena behind lower half of eyes smooth, rarely with reticulate to coriaceous microsculpture (Figs. 1F, 9F, 23F).............................................. 13

2. Medial metanotal spine very elongate, distinctly longer than distance between medial and lateral spines (Figs. 2A–B) ................................................................. 3

– Medial metanotal spine short to moderately long, at most as long as distance between medial and lateral spines (Figs. 2CF) ................................................................. 8
3. Upper gena flat to weakly concave, therefore in lateral view compound eye appearing to reach posterior margin of head (Figs. 3D, 8CD); female fore wing with distinct infuscation at level of marginal vein (Figs. 3A, 8A); mesepimeral sulcus usually absent, rarely abbreviated ventrally (Figs. 3D, 8D) .......................... 4

– Upper gena expanded, convex, therefore in lateral view compound eye separated from posterior margin by gena (Figs. 1E, 10C); female fore wing hyaline or with slight infuscation below marginal vein (Figs. 4A, 5A); mesepimeral sulcus usually complete, sometimes abbreviated ventrally (Figs. 10D, 17F) .......................... 6

4. Mesoscutal humeral sulcus smooth (Figs. 3C, 3F); central frons moderately setose throughout, reticulate-punctate (Fig. 3E); length of T1 ≥ 1.4 times width; inner orbits in female strongly diverging ventrally (Figs. 3D, 3F); West Africa, Kenya .......................... *Fusicornia ardis* Taekul & Johnson, n.sp.

– Mesoscutal humeral sulcus foveolate (Figs. 5A, 21C); central frons glabrous, with transversely arcuate striae (Figs. 8E, 21E); length of T1 ≤ 1 times width; inner orbits parallel or weakly diverging ventrally (Figs. 8E, 21E) .......................... 5

5. Scutellum bilobate (Fig. 8F); posterior half of mesoscutum longitudinally striate (Figs. 8C, 8F); inner orbits in frontal view more or less parallel (Fig. 8E); scutellum reticulate-punctate laterally (Fig. 8C); Somalia ..........................

.......................... *Fusicornia crista* Taekul & Johnson, n.sp.
– Scutellum evenly rounded (Fig. 21C); longitudinal sculpture in posterior half of mesoscutum absent (Fig. 21C, 21F); inner orbits in frontal view diverging ventrally (Fig. 21E); scutellum almost entirely smooth (Fig. 21C); Somalia

.......................................................... **Fusicornia sabrina** Taekul & Johnson, n.sp.

6. Coxae yellow (Fig. 17D); mesepimeral sulcus complete, foveate throughout (Fig. 17D, 17F); propodeum anterior to spiracle densely setose (>10 setae) (Fig. 17F)

Japan, Korea, Philippines ....................... **Fusicornia koreica** Choi & Kozlov

– Coxae brown to black (Figs. 14D, 15B, 16B); mesepimeral sulcus abbreviated (Figs. 15B, 22D); propodeum anterior to spiracle sparsely setose (< 10 setae) to glabrous (Figs. 14D, 15D)........................................................................................................................................ 7

7. A1 in female yellow to orange-brown (Figs. 14B, 15D, 16F); lateral metanotum spine moderately elongate, length distinctly greater than width (Figs. 2B, 15C, 16C); propodeal nucha smooth to weakly sculptured (Figs. 15E); mesoscutal humeral sulcus foveolate (Figs. 14C, 15C, 16C); India, Philippines, Sri Lanka, Thailand ... ....................................................... **Fusicornia indica** Mani & Sharma

– A1 in female dark brown to black (Figs. 22B,D); lateral metanotum spine very short, only slightly longer than wide (Fig. 22C); propodeal nucha strongly foveolate to longitudinally striate; mesoscutal humeral sulcus coarsely crenulate (Figs. 22C, 22F); Madagascar .............. **Fusicornia skopelos** Taekul & Johnson, n.sp.
8. Mesoscutum densely coriaceous throughout (Figs. 2D, 10CD); T1 densely setose laterally (>20 setae/side) (Fig. 10D); gena behind compound eye densely setose (Figs. 1E, 10D); female A5 bright yellow (Fig. 10F); Burkina Faso, Mali, Nigeria, Yemen …………………………………………………. \textit{Fusicornia eos} Taekul & Johnson, n. sp

– Mesoscutum reticulate, sometimes with superimposed punctures (Figs. 4C, 20C); T1 sparsely to moderately setose laterally (6-15 setae/side) (Figs. 2AC); gena behind compound eye moderately to sparsely setose (Figs. 4D; 5D, 19A,E) female A5 dark brown to black (Figs. 4B, 5B) …………………………………………………….. 9

9. Notaulus present, indicated by short groove on posterior mesonotum (Figs. 2F, 4F); female A1 dark brown to black (Fig. 4B); Madagascar …………………………………………………………………………………. \textit{Fusicornia aulacis} Taekul & Johnson, n.sp.

– Notauli absent (Figs. 2AE); female A1 yellow to orange brown (Figs. 5B, 18B, 18D, 19C) ………………………………………………………………………………………………………………………….. 10

10. Scutellum almost entirely covered by microsculpture (Fig. 20C); medial metanot al spine short to moderately long, as long as distance between medial and lateral spines (Fig. 20F); gena densely setose (Fig. 20D); Sri Lanka ………………………………………………………………………………………………………………………………………….. \textit{Fusicornia plicata} Taekul & Johnson, n.sp.

– Scutellum almost entirely smooth or with broad smooth area medially, reticulate-punctate laterally (Figs. 2C, 2E); medial metanotal spine short to moderately long, shorter than distance between medial and lateral spines (Figs. 2C, 2E, 11C); gena moderately to sparsely setose (Figs. 5D, 6D) …………………………………………………….. 11
11. Scutellum with broad smooth area medially, reticulate-punctate laterally (Figs. 2C, 5C, 6C); lateral metanotal spine moderately elongate, length distinctly greater than width (Figs. 2C, 5F, 6C); sub-Saharan Africa, Madagascar, Yemen  

………………………………………………………………. *Fusicornia bambeyi* Risbec

- Scutellum almost entirely smooth (Figs. 2E, 19D, F); lateral metanotal spine very short, only slightly longer than wide (Fig. 2E)  

12. Mesepimeral sulcus absent (Figs. 18D, 19A, C); mesopleural carina present dorsally, interrupted or absent ventrally (Figs. 19A, C, E); propodeal nucha smooth to weakly sculptured (Fig. 19F); sub-Saharan Africa, Madagascar  

………………………………………………………………. *Fusicornia paradisa* Taekul & Johnson, n.sp.

- Mesepimeral sulcus complete, foveate throughout (Fig. 11D, F); mesopleural carina absent (Fig. 11F); propodeal nucha strongly foveolate to longitudinally striate; Thailand  

………………………………………………………………. *Fusicornia episcopus* Taekul & Johnson, n.sp.

13. All coxae brown to black (Figs. 7D, 24B)  

- Mid and hind coxa yellow, fore coxa color variable (Figs. 9D, 25D)  

14. Female antennal clava yellow; radicle yellow (Figs. 12B, F); lower pronotum longitudinally striate (Figs. 12D); Papua New Guinea  

………………………………………………………………. *Fusicornia fax* Taekul & Johnson, n.sp.

- Female antennal clava dark brown to black (Figs. 7B, 24B); radicle color variable; lower pronotum reticulate to weakly rugulose (Figs. 1D, 24D)  

29
15. Pronotal cervical sulcus present (Fig. 7F); propodeal nucha strongly foveolate to longitudinally striate; mesopleural carina complete (Fig. 7D); mesoscutal humeral sulcus coarsely foveolate (Fig. 7C); Papua New Guinea .........................................................

......................................................... *Fusicornia collaris* Taekul & Johnson, n.sp.

- Pronotal cervical sulcus absent (Fig. 24C); propodeal nucha smooth to weakly sculptured; mesopleural carina present dorsally, interrupted or absent ventrally (Figs. 24D, F); mesoscutal humeral sulcus foveolate (Fig. 24C); sub-Saharan Africa, Arabian Peninsula ............................... *Fusicornia spinosa* (Risbec)

16. Mesepimeral sulcus complete or briefly interrupted medially, foveate above, appearing as fold ventrally (Figs. 9D, 25D); propodeal nucha strongly foveolate to longitudinally striate; area 4 of metapleuron setose ventrally, area 2 polygonal, setose ................................................................. 17

- Mesepimeral sulcus absent or indicated only in dorsal extreme (Figs. 13D, 23D); propodeal nucha smooth to weakly sculptured; area 4 of metapleuron glabrous, area 2 linear, glabrous (Fig. 23D) ................................................................. 18

17. Fore coxa brown, mid and hind coxae yellow (Fig. 9D); scutellum with broad smooth area medially, reticulate-punctate laterally (Fig. 9F); lateral metanotal spine moderately elongate, length distinctly greater than width (Fig. 9C); Vanuatu ...........

................................................................. *Fusicornia dissita* Taekul & Johnson, n.sp.

- All coxae yellow (Fig. 25D); scutellum almost entirely smooth (Fig. 25F); lateral metanotal spine very short, only slightly longer than wide (Fig. 25F); Brunei,
Indonesia, Japan, Laos, Malaysia, Papua New Guinea, Philippines, Sri Lanka, Thailand .............................. \textit{Fusicornia tehrii} Mukerjee

18. Mesepimeral sulcus present dorsally, abbreviated ventrally (Figs. 13D, F); gena behind lower half of eye with reticulate to coriaceous microsculpture (Fig. 13D); Madagascar, Yemen ................. \textit{Fusicornia fortuna} Taekul & Johnson, n.sp.

- Mesepimeral sulcus absent (Figs. 23D, F); gena behind lower half of eye smooth (Fig. 23F); Madagascar, Nigeria, Uganda .........................................................

...........................................\textit{Fusicornia speculum} Taekul & Johnson, n.sp.

3.7 Species Descriptions

\textit{Fusicornia ardis} Taekul & Johnson, new species

(Figures 3AF)

\textbf{Description.} Female body length: 2.43–2.81 mm (n=7). Male body length: 2.04–2.28 mm (n=20).


Metasoma: Length of T1: equal or more than 1.4 times width. Horn on T1 of female: absent, T1 longitudinally furrowed throughout length. Lateral setation of T1: sparsely to moderately setose (6–15/side). Medial sculpture on T3: smooth and shiny.

**Diagnosis.** *Fusicornia ardis* is distinguishable on the basis of the elongate medial and weakly produced lateral metascutellar spines (Figs. 2A, 3F), the elongate T1 (length
1. 4 times width), the smooth mesoscutal humeral sulcus, and the convergent inner orbits
in in the female (Figs. 2C–F).

**Etymology.** The epithet ardis, Greek for the point of an arrow, refers to the
medial metanotal spine.

**Material Examined.** Holotype female: NIGERIA: Ife, Osun St., IX. 1974, J. T.
Medler, OSUC 148952 (deposited in CNCI). Paratypes: BENIN: 1 female, OSUC
206107 (CNCI). BURKINA FASO: 30 males, 3 females, OSUC 148942-148943,
148950, 164011–164014, 206108–206133 (CNCI). IVORY COAST: 1 male, 1
NIGERIA: 1 female, OSUC 148956 (CNCI).

*Fusicornia aulacis* Taekul & Johnson, new species

(Figures 4AF)

**Description.** Female body length: 2.55–2.75 mm (n=18). Male body length: 2.53–2.69
mm (n=11).

Head: Vertex between posterior ocelli: rounded. Female OOL: more than one ocellar
diameter. Frontal sculpture: entirely and evenly sculptured. Sculpture of central frons:
reticulate punctate. Setation of central frons: moderately setose throughout. Inner orbit in
frontal view: more or less parallel. Upper gena in dorsal view of female: expanded,
convex, therefore in lateral view compound eye separated from posterior margin by gena.
Sculpture of gena behind lower half of eye: with reticulate to coriaceous microsculpture.
Setation of gena: moderately setose. Antenna: Radical color: yellow to orange brown.
Longitudinal sculpture in posterior half of mesoscutum: absent. Admedian line: present.
Mesoscutal humeral sulcus: very coarsely foveolate. Notauli: present, indicated by short
groove on posterior mesonotum . Mesoscutellum shape: rounded. Sculpture of
mesoscutellum: almost entirely covered by microsculpture. Length of medial
metascutellar spine: medial spine short to moderately long, as long as distance between
median and lateral spines. Length of lateral metascutellar spine: moderately elongate,
length distinctly greater than width. Sculpture of propodeal nucha: strongly foveolate to
longitudinally striate. Sculpture of suprahumeral area of pronotum: puncticulate.
Sculpture in lower pronotum: reticulate to weakly rugulose. Netrion setation: sparsely
setose to glabrous. Mesopleural carina: present dorsally, interrupted or absent ventrally.
Mesepimeral sulcus: complete, foveate throughout. Area 2 on metapleuron: linear,
 glabrous. Setation of area 4 of metapleuron: glabrous. Setation in anteroventral
metapleural triangle: absent. Setation of propodeum anterior to spiracle: sparsely setose
(less than 10) or absent. Legs: Coxae color: all coxae brown to black. Wings: Female fore
wing maculation: hyaline or with slight infuscation below marginal vein.
Metasoma: Length of T1: less than or equal to one times width. Horn on T1 of female:
absent, T1 longitudinally furrowed throughout length. Lateral setation of T1: sparsely to
moderately setose (6-15/side). Medial sculpture on T3: shallowly longitudinal rugulose
and reticulate.
**Diagnosis.** *Fusicornia aulacis* is unique in the genus in the possession of short, but distinct notauli (Figs. 2F, 4C, F).

**Etymology.** The epithet *aulacis*, Latin for furrow, refers to the notauli.


*Fusicornia bambeyi* Risbec

(Figures 5A–F, 6AF)


**Description.** Female body length: 2.31–2.81 mm (n=20). Male body length: 2.39–2.74 mm (n=20).

Head: Vertex between posterior ocelli: rounded. Female OOL: less than or equal one ocellar diameter, or more than one ocellar diameter. Frontal sculpture: entirely and evenly sculptured. Sculpture of central frons: reticulate punctate. Setation of central
frons: moderately setose throughout. Inner orbit in frontal view: more or less parallel.

Upper gena in dorsal view of female: expanded, convex, therefore in lateral view
compound eye separated from posterior margin by gena. Sculpture of gena behind lower
half of eye: with reticulate to coriaceous microsculpture. Setation of gena: moderately
setose. Antenna: Radical color: yellow to orange brown. Color of female A1: yellow to


Mesosoma: Pronotal cervical sulcus: absent. Mesoscutum sculpture: reticulate
with superimposed punctures. Longitudinal sculpture in posterior half of mesoscutum:
absent. Admedian line: present, absent. Mesoscutal humeral sulcus: foveolate. Notauli:
absent. Mesoscutellum shape: rounded. Sculpture of mesoscutellum: almost entirely
smooth, with broad smooth area medially, reticulate punctate laterally. Length of medial
metascutellar spine: medial spine short to moderately long, distinctly shorter than
distance between medial and lateral spines. Length of lateral metascutellar spine:
moderately elongate, length distinctly greater than width. Sculpture of propodeal nucha:
smooth to weakly sculptured. Sculpture of suprahumeral area of pronotum: puncticulate.

Sculpture in lower pronotum: longitudinally striate. Netrion setation: sparsely setose to
glabrous. Mesopleural carina: complete, present dorsally, interrupted or absent ventrally.
Mesepimeral sulcus: abbreviated, complete or briefly interrupted, foveate above,
appearing as fold ventrally. Area 2 on metapleuron: polygonal, setose, linear, setose.

Setation of area 4 of metapleuron: setose ventrally, glabrous. Setation in anteroventral
metapleural triangle: absent. Setation of propodeum anterior to spiracle: sparsely setose
(less than 10) or absent. Legs: Coxae color: all coxae brown to black, all coxae yellow,
fore coxa brown, mid and hind coxa yellow. Wings: Female fore wing maculation:
hyaline or with slight infuscation below marginal vein, with distinct infuscation at level
of marginal vein.

Metasoma: Length of T1: less than or equal to one times width. Horn on T1 of
female: well developed, sculpture on horn very weak or absent, present as low elevation,
sculpture on horn variable. Lateral setation of T1: sparsely to moderately setose (6–
15/side). Medial sculpture on T3: smooth and shiny.

**Diagnosis.** *Fusicornia bambeyi* is most similar to *F. paradisa* and may be
distinguished from it on the basis of the sculpture of scutellum and shape of the metanotal
spines. The scutellum of *F. bambeyi* has a broad smooth area medially, and is reticulate
punctate laterally; the lateral metanotal spine is moderately elongate, its length distinctly
greater than its width and it is confluent with the medial spine (Figs. 2C, 5C, F, 6C).

**Material Examined.** **BENIN**: 1 female, OSUC 148978 (CNCI). **BOTSWANA**:
4 females, OSUC 162177–162179 (OSUC); OSUC 148980 (CNCI). **BURKINA FASO**:
31 males, 26 females, OSUC 148958–148959, 148971–148972, 148990, 164009–
164010, 164018–164020, 206134–206138, 206292–206321, 208104, 208108, 208110,
208112–208120 (CNCI). **CAMEROON**: 2 males, 4 females, OSUC 148975, 208030,
208101, 208144 (CNCI); OSUC 211152, 211153 (BMNH). **CENTRAL AFRICAN
REPUBLIC**: 9 males, 2 females, OSUC 211070 (OSUC); OSUC 180738–180740,
180935, 211044, 211050–211052, 211069 (SAMC); OSUC 208105 (CNCI). **GABON**:
23 males, 2 females, OSUC 148974, 149015, 206183–206186, 206188–206205, 208031
(CNCI). **GAMBIA**: 1 female, OSUC 206187 (CNCI). **GHANA**: 1 male, OSUC 211064
(OSUC). **GUINEA-BISSAU**: 1 male, OSUC 148977 (CNCI). **IVORY COAST**: 1

**Comments.** Risbec (1957) described *F. bambeyi* variety *inermis* on the basis of a single female specimen from M’Boro (Senegal). He distinguished it from the nominal species by the following characters: body length 1.40 mm; body color entirely black; sculpture on mesonotum weaker than *F. bambeyi*, the scutellum smooth and shining; head with the mandibles are slightly smaller, the face and the vertex with very fine reticulation. From this study, there are the specimens with characters similar to the description of *inermis* (Figs. 6AF): OSUC 148977, 148979, 148981, 148993, 162178, 206308, 208103, and 211049. Some specimens show variability in coxal color, in which the fore coxae are dark, and the mid and hind coxae yellow: OSUC 148980, 148981, 162177, 162179, 206137, 208107. Because of the uniformity of the principal characters, the sculpture of scutellum, the configuration of the median and lateral metanotal spines, and the setation of areas 2 and 4 of metapleuron, these specimens were determined to be *F. bambeyi.*
Fusicornia collaris Taekul & Johnson, new species

(Figures 7A–F)

**Description.** Female body length: 1.42–2.03 mm (n=3). Male body length: unknown.


complete, foveate throughout. Area 2 on metapleuron: polygonal, setose. Setation of area 4 of metapleuron: glabrous. Setation in anteroventral metapleural triangle: absent. Setation of propodeum anterior to spiracle: sparsely setose (less than 10) or absent. Legs: Coxae color: all coxae brown to black. Wings: Female fore wing maculation: hyaline or with slight infuscation below marginal vein.

Metasoma: Length of T1: less than or equal to one times width. Horn on T1 of female: absent, T1 longitudinally furrowed throughout length. Lateral setation of T1: sparsely to moderately setose (6–15/side). Medial sculpture on T3: smooth and shiny.

**Diagnosis.** *Fusicornia collaris* is most similar to *F. spinosa* and may be distinguished from it by the presence of a pronotal cervical sulcus and the strongly foveolate to longitudinally striate sculpture of the propodeal nucha (Figs. 7C, F).

**Etymology.** The epithet *collaris*, Latin for collar, refers to the pronotal cervical sulcus (Fig. 7F).

Fusicornia crista Taekul & Johnson, new species

(Figures 8A–F)

Description. Female body length: 2.32 mm (n=1). Male body length: unknown.


Setation of area 4 of metapleuron: setose ventrally. Setation in anteroventral metapleural triangle: absent. Setation of propodeum anterior to spiracle: sparsely setose (less than 10) or absent. Legs: Coxae color: all coxae brown to black. Wings: Female fore wing maculation: with distinct infuscation at level of marginal vein.

Metasoma: Length of T1: less than or equal to one times width. Horn on T1 of female: absent, T1 longitudinally furrowed throughout length. Lateral setation of T1: sparsely to moderately setose (6–15/side). Medial sculpture on T3: smooth and shiny.

**Diagnosis.** *Fusicornia crista* is most similar to *F. sabrina*, which was collected from the same locality in Somalia. *Fusicornia crista* may be distinguished by the bilobate scutellum and the longitudinally striate sculpture of the posterior half of mesoscutum (Figs. 8C, F).

**Etymology.** The epithet *crista*, Latin for ridge, refers to the carina on the vertex between posterior ocelli (Fig. 8E).

**Material Examined.** Holotype female: **SOMALIA**: Afgooye (Afgoi), Shabelle (Shabelli) Valley, Mogadishu, 7.IV.1977 – 14 IV.1977, Malaise trap, F. (Ferdinando), Bin, OSUC 148957 (deposited in CNCI).
**Fusicornia dissita** Taekul & Johnson, new species

(Figures 9A–F)

**Description.** Female body length: 1. 69–1. 81 mm (n=2). Male body length: unknown.


Mesopleural carina: present dorsally, interrupted or absent ventrally. Mesepimeral sulcus: complete or briefly interrupted, foveate above, appearing as fold ventrally. Area 2 on metapleuron: polygonal, setose. Setation of area 4 of metapleuron: setose ventrally. Setation in anteroventral metapleural triangle: absent. Setation of propodeum anterior to spiracle: sparsely setose (less than 10) or absent. Legs: Coxae color: fore coxa brown, mid and hind coxa yellow. Wings: Female fore wing maculation: hyaline or with slight infuscation below marginal vein.

Metasoma: Length of T1: less than or equal to one times width. Horn on T1 of female: absent, T1 longitudinally furrowed throughout length. Lateral setation of T1: sparsely to moderately setose (6-15/side). Medial sculpture on T3: smooth and shiny.

**Diagnosis.** *Fusicornia dissita* is similar to *F. speculum*, *F. fortuna*, and *F. tehrii* in smooth sculpture of the central frons; it may be distinguished by the moderately elongate lateral metanotal spine and the brown fore coxa (Figs. 9B, D).

**Etymology.** The epithet *dissita*, Latin for remote or far, is a reference to the distance of the collecting locality, Vanuatu, from the distribution of the other species of the genus.

Fusicornia eos Taekul & Johnson, new species

(Figures 10AF)

**Description.** Female body length: 1.72–1.98mm (n=15). Male body length: 1.54–1.68mm (n=4).


Wings: Female fore wing maculation: with distinct infuscation at level of marginal vein.

Metasoma: Length of T1: less than or equal to one times width. Horn on T1 of female: absent, T1 longitudinally furrowed throughout length. Lateral setation of T1: densely setose (>20/side). Medial sculpture on T3: smooth and shiny.

**Diagnosis.** *Fusicornia eos* can be instantaneously distinguished from other species in this genus with unique characters of this species. In both sex the sculpture on mesoscutum and scutellum is densely coriaceous and almost entirely covered by microsculpture (Figs. 2D, 10C, D). In female, *F. eos* is immediately recognized by the bright-yellow color on A5 (Fig. 10F).

**Etymology.** The epithet *eos*, meaning dawn, refers to the bright yellow A5 of the female antenna, a distinctive character for this species.

164024, 164025, 206179–206181 (CNCI). **NIGERIA**: 1 male, 3 females, OSUC 148968–148969, 206177–206178 (CNCI). **YEMEN**: 2 females, OSUC 206249, 206259 (CNCI).

*Fusicornia episcopus* Taekul & Johnson, new species

(Figures 11A–F)

**Description.** Female body length: 1.35 mm (n=1). Male body length: unknown.


Metasoma: Length of T1: less than or equal to one times width. Horn on T1 of female: absent, T1 longitudinally furrowed throughout length. Lateral setation of T1: sparsely to moderately setose (6–15/side). Medial sculpture on T3: shallowly longitudinal rugulose and reticulate.

**Diagnosis.** *Fusicornia episcopus* is most similar to *F. paradisa* and may be distinguished from it by the completeness of mesepimeral sulcus and the strongly foveolate to longitudinally striate sculpture of propodeal nucha (Figs. 10D, F).

**Etymology.** The epithet *episcopus*, Latin for bishop, refers to the depository of the holotype of this species.

**Material Examined.** Holotype female: **THAILAND**: Trang Prov, Khao Phap Pha Mountain, 200–400m, Khao Chong Mt., 3 I. 1964, G. A., Samuelson, OSUC 179113 (deposited in BPBM).
**Fusicornia fax Taekul & Johnson, new species**

(Figures 12A–F)

**Description.** Female body length: 1.68 mm (n=1). Male body length: unknown.

Head: Vertex between posterior ocelli: rounded. Female OOL: more than one ocellar diameter. Frontal sculpture: at least partly smooth or considerably effaced. 

Sculpture of central frons: smooth or with shallowly impressed reticulate microsculpture.

Setation of central frons: glabrous. Inner orbit in frontal view: more or less parallel.


area 4 of metapleuron: setose ventrally. Setation in anteroventral metapleural triangle: absent. Setation of propodeum anterior to spiracle: sparsely setose (less than 10) or absent. Legs: Coxae color: all coxae brown to black. Wings: Female fore wing maculation: hyaline or with slight infuscation below marginal vein.

Metasoma: Length of T1: less than or equal to one times width. Horn on T1 of female: well developed, sculpture on horn very weak or absent. Lateral setation of T1: sparsely to moderately setose (6–15/side). Medial sculpture on T3: smooth and shiny.

**Diagnosis.** With unique character in having bright-yellow clava of *Fusicornia fax*, it can be immediately distinguished this species from the species cluster of the genus (Figs. 12A, B, F).

**Etymology.** The specific epithet *fax*, torch or firebrand, refers to the unique bright color of clava.


*Fusicornia fortuna* Taekul & Johnson, new species

(Figures 13A–F)

**Description.** Female body length: 1.23–1.73 mm (n=2). Male body length: 1.71 mm (n=1).

Head: Vertex between posterior ocelli: rounded. Female OOL: less than or equal one ocellar diameter. Frontal sculpture: at least partly smooth or considerably effaced. Sculpture of central frons: smooth or with shallowly impressed reticulate microsculpture.

Metasoma: Length of T1: less than or equal to one times width. Horn on T1 of female: absent, T1 longitudinally furrowed throughout length, well developed, sculpture on horn very weak or absent. Lateral setation of T1: sparsely to moderately setose (6–15/side). Medial sculpture on T3: smooth and shiny.

**Diagnosis.** *Fusicornia fortuna* is most similar to *F. speculum* with which it shares the absence of setation on area 2 and 4 on metapleuron and smooth to weakly-sculptured propodeal nucha (Fig. 13F). It may be distinguished by gena behind lower half of the eye with reticulate to coriaceous microsculpture (Figs. 13D).

**Etymology.** The epithet *fortuna*, is an arbitrary name, inspired by the code originally used for this species, F-8.


*Fusicornia indica* Mani & Sharma

(Figures 14A–F, 15A–F, 16A–F)


**Description.** Female body length: 2.19–2.58 mm (n=11). Male body length: 2.25–2.47 mm (n=7).

Head: Vertex between posterior ocelli: rounded. Female OOL: less than or equal one ocellar diameter. Frontal sculpture: entirely and evenly sculptured. Sculpture of

Metasoma: Length of T1: less than or equal to one times width. Horn on T1 of female: well developed, sculpture on horn very weak or absent. Lateral setation of T1: densely setose (>20/side). Medial sculpture on T3: smooth and shiny.

**Diagnosis.** *Fusicornia indica* is most similar to *F. skopelos* by sharing the black color of coxae and the abbreviation of mesepimeral sulcus. It may be immediately distinguished this species by yellow to orange-brown color of A1 in female and color of female funicle (A3–A6): A3, base of A4 yellow, apex of A4, A5–A6 dark brown (Figs. 14B, 15D, 16F). In both sex, lateral metanotal spine is moderately elongate, length distinctly greater than width and propodeal nucha is smooth to weakly sculpture (Figs. 14C, 15C, E).

**Material Examined.** Paratypes: **INDIA**: 2 males, 2 females, OSUC 148939, 148940, 164008, 206243 (deposited in CNCI). Other materials: **AUSTRALIA**: 1 male, 2 females, OSUC 210367 (OSUC), 211065 (ANIC), ANIC DB 32–20455 (ANIC). **INDIA**: 2 females, OSUC 148941 (CNCI); OSUC 210294 (USNM). **PHILIPPINES**: 1 female, OSUC 179112 (BPBM). **SRI LANKA**: 3 females, OSUC 149021–149022 (CNCI); OSUC 210292 (USNM). **THAILAND**: 5 males, 5 females, OSUC 149004, 149027–149028, 206282, 206284, 206287, 206288, 206289, 206290–206291 (CNCI).

**Comments**: The specimens of *F. indica* from Australia differ from those from India and Southeast Asia by the absence of horn on T1 in female (Fig. 15E) (OSUC 210367) and the color of female funicle (A3–A6): A3, A4, base of A5 yellow, apex of A5, A6 dark brown (Fig. 16F ; ANIC DB 32–20455, OSUC 211065). However, they
share the most significant characters, including the sculpture of the scutellum, coxal colors, the relative lengths of the medial and lateral metanotal spines, and the shape and setation of the metapleural areas. Therefore, I consider the Australian specimens to be F. indica.

**Fusicornia koreica** Choi & Kozlov

(Figures 17A–F)

*Fusicornia koreica* Choi & Kozlov, 2001: 100. (description).

**Description.** Female body length: 3.55–3.83 mm (n=12). Male body length: 3.47–3.52 mm (n=2).


   Mesosoma: Pronotal cervical sulcus: absent. Mesoscutum sculpture: reticulate with superimposed punctures. Longitudinal sculpture in posterior half of mesoscutum:

Metasoma: Length of T1: less than or equal to one times width. Horn on T1 of female: absent, T1 longitudinally furrowed throughout length. Lateral setation of T1: sparsely to moderately setose (6–15/side). Medial sculpture on T3: smooth and shiny.

**Diagnosis.** *Fusicornia koreica* is most similar to *F. indica* and *F. skopelos* and it may be immediately recognized by the intense setation on propodeum anterior to spiracle area, unique character among the species in this genus (Figs. 1A, 17D, F).

**Material Examined.** **JAPAN:** 3 males, 13 females, OSUC 148999, 149000, 149001–149003, 164021, 206220–206229 (deposited in CNCI). **PHILIPPINES:** 1 female OSUC 149025 (CNCI).
**Fusicornia paradisa** Taekul & Johnson, new species

(Figures 18A–F, 19A–F)

**Description.** Female body length: 1.71–2.05 mm (n=20). Male body length: 1.59–1.85 mm (n=20).


Metasoma: Length of T1: less than or equal to one times width. Horn on T1 of female: absent, T1 longitudinally furrowed throughout length. Lateral setation of T1: sparsely to moderately setose (6–15/side). Medial sculpture on T3: smooth and shiny.

Diagnosis. *Fusicornia paradisa* is most similar to *F bambeyi* and may be distinguished by the smooth and shining scutellum and the short lateral metanotal spine which is distinctly separated from the medial spine. Additionally, the setation in area 2 on metapleuron is absent, although the shape of of this area is variable (Figs. 18D, F, 19A, C, E).

Etymology. The epithet *paradisa*, inspired by the English common name bird of paradise, refers to the attractive maculation of the fore wing.

**Fusicornia plicata** Taekul & Johnson, new species

(Figures 20A–F)

**Description.** Female body length: 1.59 mm (n=1). Male body length: unknown.


Metasoma: Length of T1: less than or equal to one times width. Horn on T1 of female: present as low elevation, sculpture on horn variable. Lateral setation of T1: sparsely to moderately setose (6–15/side). Medial sculpture on T3: smooth and shiny.
**Diagnosis.** *Fusicornia plicata* is most similar to *F. tehrii*, as the same oriental species and may be instantly recognized it from reticulate punctate sculpture on central frons and scutellum sculpture which is almost entirely covered by microsculpture (Figs. 20C, E, F).

**Etymology.** The epithet *plicata*, Latin for folded, refers to the intricate sculpture of central frons and mesoscutellum.


*Fusicornia sabrina* Taekul & Johnson, new species

(Figures 21A–F)

**Description.** Female body length: 2.68 mm (n=1). Male body length: unknown.


Metasoma: Length of T1: less than or equal to one times width. Horn on T1 of female: well developed, sculpture on horn very weak or absent. Lateral setation of T1: sparsely to moderately setose (6–15/side). Medial sculpture on T3: smooth and shiny.

**Diagnosis.** *Fusicornia sabrina* is very similar to *F. crista* in having transversely arcuate striae sculpture on central frons, and it can be identified by the rounded shape of scutellum and without longitudinal sculpture on posterior half of mesoscutum (Figs. 21C, E–F).

**Etymology.** The epithet sabrina refers to the water nymph and to the collecting locality along the river.

_Fusicornia skopelos_ Taekul & Johnson, new species

(Figures 22A–F)

Description. Female body length: 2. 53–2. 79 mm (n=2). Male body length: 2. 32mm (n=1).


Metasoma: Length of T1: less than or equal to one times width. Horn on T1 of female: absent, T1 longitudinally furrowed throughout length. Lateral setation of T1: sparsely to moderately setose (6–15/side). Medial sculpture on T3: smooth and shiny.

**Diagnosis.** In spite of collected from afratropical realm, *Fusicornia skopelos* is most similar to *F. indica* in having the same coxae colors and the abbreviation of mesepimeral sulcus. Nonetheless, it is immediately distinguished from *F. indica* by coarsely crenulate appearance of mesoscutal humeral sulcus on mesoscutum (Fig. 22F).

**Etymology.** The epithet *skopelos*, Greek for projecting rock or cliff, refers to the deeply incised mesoscutal humeral sulcus.

**Material Examined.** Holotype female: MADAGASCAR: Toliara Auto. Prov., Bezaha Mahafaly Special Reserve, 23°41.19'S 44°35.46'E, 165m, MA-02-14A-11, dry deciduous forest, parcel I, nr. research station, 16 I. 2002 – 18 I. 2002, Malaise trap, R.
(Rin'ha), Harin'Hala, CASENT 2042207 (deposited in CASC). Paratypes:

**MADAGASCAR**: 1 male, 2 females, CASENT 2029780, 2029781, 2043965 (CASC).

*Fusicornia speculum* Taekul & Johnson, new species

(Figures 23A–F)

**Description.** Female body length: 1.36–1.7 mm (n=4). Male body length: 1.45–1.66 mm (n=5).


Metasoma: Length of T1: less than or equal to one times width. Horn on T1 of female: well developed, sculpture on horn very weak or absent. Lateral setation of T1: sparsely to moderately setose (6–15/side). Medial sculpture on T3: smooth and shiny.

**Diagnosis.** *Fusicornia speculum* is most similar to the cluster of species *F. fortuna*, *F. dissita*, and *F. tehrii*. It is distinguished not only by the absence of setation in area 2 and 4 and mesepimeral sulcus, but also by the smooth sculpture of gena behind lower half of the eye (Figs. 23D, F).

**Etymology.** The epithet *speculum*, Latin for mirror, refers to the smooth and shining sculpture of the scutellum.

**Material Examined.** Holotype female: MADAGASCAR: Toliara Prov., Berenty Private Reserve, 25°00'S 46°17'E, 80km W Tôlanaro (Fort-Dauphin), 6 VI. 1994, Malaise trap, M., Wasbauer, OSUC 206217 (deposited in CNCI). Paratypes:

- MADAGASCAR: 3 males, 4 females, CASENT 2043726, 2134117, 8106183 (CASC);
- OSUC 148998, 206216, 206218–206219 (CNCI).
- NIGERIA: 1 male, OSUC 208124 (CNCI).
- UGANDA: 1 male, OSUC 206247 (CNCI).

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*Fusicornia spinosa* (Risbec)

(Figures 24A–F)

*Procacus spinosus* Risbec, 1953: 575; *Fusicornia spinosa* (Risbec), Masner, 1976: 42

(Generic transfer, type information).

**Description.** Female body length: 1.44–1.9 mm (n=20). Male body length: 1.44–1.69 mm (n=20).


Metasoma: Length of T1: less than or equal to one times width. Horn on T1 of female: absent, T1 longitudinally furrowed throughout length. Lateral setation of T1: sparsely to moderately setose (6–15/side). Medial sculpture on T3: smooth and shiny.

**Diagnosis.** *Fusicornia spinosa* is most similar to *F.collaris* and may be immediately distinguished by the absence of pronotal cervical sulcus, the presence of mesopleural carina, and the smooth to weakly sculpture of propodeal nucha (Figs. 24 D –F).

**Material Examined.** BENIN: 1 male, OSUC 206151 (deposited in CNCI).

206155 (CNCl); OSUC 181484, 181678, 208156–208207, 211001–211043, 211060–211061, 211071–211151, 211165–211198 (OSUC). **Yemen**: 1 male, 1 unknown, 4 females, OSUC 206149, 206248, 206254, 206256, 206148, 206253 (CNCi).

**Zimbabwe**: 5 males, 10 females, OSUC 148962, 148964, 164016, 206156, 206157, 206161–206167, 206158–206164, 206166.

*Fusicornia tehrii* Mukerjee

(Figures 25A–F)

*Fusicornia tehrii* Mukerjee, 1993: 75, 77 (original description)

*Fusicornia noonae* Buhl, 1998: 271 (original description) **New synonymy**.

**Description.** Female body length: 1.55–1.87 mm (n=20). Male body length: 1.38–1.56 mm (n=11).


Metasoma: Length of T1: less than or equal to one times width. Horn on T1 of female: absent, T1 longitudinally furrowed throughout length. Lateral setation of T1: sparsely to moderately setose (6–15/side). Medial sculpture on T3: smooth and shiny.

**Diagnosis.** With the sculpture of central frons: smooth or with shallowly impressed reticulate microsculpture, *Fusicornia tehrii* is different to the cohort of the species from Asia, *F. koreica, F. indica,* and *F. episcopus.* This oriental species is immediately distinguished by the appearance of lateral metanotal spine, very short, the
smooth sculpture on central frons, and the sculpture of mesoscutellum, almost entirely smooth (Figs 25D–F).

**Material Examined. BANGLADESH:** 2 females, OSUC 211161–211162 (deposited in CNCI). **Brunei:** 3 females, OSUC 149020, 206280–206281 (CNCI). **INDIA:** 1 male, OSUC 149007 (CNCI). **INDONESIA:** 1 male, 5 females, OSUC 149005, 149008, 149019, 149026, 206231 (CNCI); UCRC ENT 171070 (UCRC). **JAPAN:** 1 female OSUC 179124 (BPBM). **LAOS:** 1 male, 1 female, OSUC 179119, 179120 (BPBM). **MALAYSIA:** 5 males, 2 females, OSUC 179114 (BPBM); OSUC 149011, 149030, 164022, 206230, 206232, 206234 (CNCI). **PAPUA NEW GUINEA:** 1 female, OSUC 179116 (BPBM). **PHILIPPINES:** 4 females, OSUC 179111, 179121, 179122, 211164 (BPBM). **SINGAPORE:** 1 male, OSUC 149006 (CNCI). **SRI LANKA:** 3 male, 2 females, OSUC 149023, 149024, 206283, 206286 (CNCI); OSUC 210293 (USNM). **THAILAND:** 6 females, OSUC 211163 (BPBM); OSUC 149009, 149010, 149029, 206233 (CNCI); OSUC 211200 (OSUC).

**Comments:** *F. tehrii* was originally described by Mukerjee (1993) on the basis of a single male specimen from Narendra Nagar (Tehri), India. Subsequently, Buhl (1998) described *F. noonae* from the Philippines, also on the basis of a single male specimen. The characters of *F. noonae* presented by Buhl (1998) are identical to the description of *F. tehrii*. These characters comprise the smooth sculpture of the central frons, sparse setation of the gena, the smooth and shining sculpture of the scutellum, and smooth and shining sculpture on T3 (Figs. 25C–F). In Buhl’s (1998) description of *F. noonae* he discussed *F. indica*, *F. bambeyi*, and *F. spinosa*, but no mention was made of *F. tehrii*. 
despite its availability. I have examined the holotype of *F. noonae* (Figs. 26A–D); Dr. Rajmohana K. (Zoological Survey of India, Calicut) examined the holotype of *F. tehrii* using the characters from this study.
3.8 Discussion and Prospects

Within the subfamily Scelioninae, _Fusicornia_ was placed in the tribe Psilanteridini (Masner 1976), until Austin and Field (1997) examined the ovipositor structure and concluded that the genus was misplaced within that tribe. Platygastrid wasps have two functionally different types of the ovipositor system: (1) the _Ceratobaeus_-type that is extended and retracted by antagonistic muscles and (2) the _Scelio_-type that is operated changes in hydroscopic pressure. Austin and Field (1997) also suggested that the _Scelio_-type is apomorphic, defining a monophyletic group associated with orthopteran host-eggs. They also claimed it to be the ground plan for the family. The Psilanteridini, which possesses 24 genera, contains both types of ovipositor systems. Five genera of the tribe (Masner 1976, Austin and Field 1997) have a _Ceratobaeus_-type ovipositor system including _Anteris_, _Leptoteleia_, _Opisthacantha_, _Styloteleia_, and _Fusicornia_. Consequently it is likely that this tribe is not monophyletic group and it is unclear where these genera belong. They probably need to be placed into new higher-level categories after the relationships among these genera are scrutinized. Additionally, as one of only seven genera (_Echthrodesis_, _Habroteleia_, _Mantibaria_, _Neuroscelio_, _Sparasion_, and _Nixonia_), _Fusicornia_ has a _Ceratobaeus_-type system but lacks a medial apodeme on S6. Further study is needed in order to determine the proper placement of _Fusicornia_.

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The evolutionary relationships among species within genus *Fusicornia* have not yet been studied. This will require reexamination of the descriptive characters used here and the generation of molecular data. The understanding of evolutionary relationships will help provide insights into the ecology, biology, and taxonomy of species in *Fusicornia*. 
Figure 1: Metapleuron area, pronotum and gena, lateral view. A. *Fusicornia koreica* Choi & Kozlov, female (OSUC 206225); B. *Fusicornia paradisa*, n.sp., female (OSUC 206278); C. *Fusicornia koreica* Choi & Kozlov, female (OSUC 206225); D. *Fusicornia spinosa* (Risbec), female (OSUC 211169); E. *Fusicornia eos*, n.sp., female holotype (OSUC 206174); F. *Fusicornia spinosa* (Risbec), female (OSUC 211169). Scale bars in millimeters.
Figure 2: Mesoscutum and scutellum sculpture, metanotal spine and T1, dorsal view. A. *Fusicornia ardis*, n.sp., female holotype (OSUC 148952); B. *Fusicornia indica* Mani & Sharma., female (OSUC 149027); C. *Fusicornia bambeyi* Risbec, female (OSUC 206302); D. *Fusicornia eos*, n.sp., female holotype (OSUC 206174); E. *Fusicornia paradisa*, n.sp., female holotype (OSUC 206350); F. *Fusicornia aulascis*, n.sp., female holotype (CASENT 2042841). Scale bars in millimeters.
Figure 3: *Fusicornia ardis*, n.sp., female holotype (OSUC 148952). A. Dorsal habitus; B. Lateral habitus; C. Head and mesosoma, dorsal view; D. Head and mesosoma, lateral view; E. Head, anterior view; F. Metanotal spine and T1 dorsal view. Scale bars in millimeters.
Figure 4: *Fusicornia aulacis*, n.sp., female holotype (CASENT 2042841). A. Dorsal habitus; B. Lateral habitus; C. Head and mesosoma, dorsal view; D. Head and mesosoma, lateral view; E. Head, anterior view; F. Notauli, mesoscutellum, and T1 dorsal view. Scale bars in millimeters.
Figure 5: *Fusicornia bambeyi* Risbec, female (OSUC 164019). A. Dorsal habitus; B. Lateral habitus; C. Head and mesosoma, dorsal view; D. Head and mesosoma, lateral view; E. Head, anterior view; F. Mesoscutellum, metanotal spine and T1 dorsal view. Scale bars in millimeters.
Figure 6: *Fusicornia bambei* Risbec, female (OSUC 148981). A. Dorsal habitus; B. Lateral habitus; C. Head and mesosoma, dorsal view; D. Head and mesosoma, lateral view; E. Head, anterior view; F. Metasoma and T1 lateral view. Scale bars in millimeters.
Figure 7: *Fusicornia collaris*, n.sp., female holotype (OSUC 179115). A. Dorsal habitus; B. Lateral habitus; C. Head and mesosoma, dorsal view; D. Head and mesosoma, lateral view; E. Head, anterior view; F. Pronotal cervical sulcus dorsal view. Scale bars in millimeters.
Figure 8: *Fusicornia crista*, n.sp., female holotype (OSUC 148957). A. Dorsal habitus; B. Lateral habitus; C. Head and mesosoma, dorsal view; D. Head and mesosoma, lateral view; E. Head, anterior view; F. Mesoscutellum, dorsal view. Scale bars in millimeters.
Figure 9: *Fusicornia dissita*, n.sp., female holotype (OSUC 149012). A. Dorsal habitus; B. Lateral habitus; C. Head and mesosoma, dorsal view; D. Head and mesosoma, lateral view; E. Head, anterior view; F. Gena, lateral view. Scale bars in millimeters.
Figure 10: *Fusicornia eos*, n.sp., female holotype (OSUC 206174). A. Dorsal habitus; B. Lateral habitus; C. Head and mesosoma, dorsal view; D. Head and mesosoma, lateral view; E. Head, anterior view; F. Antenna. Scale bars in millimeters.
Figure 11: *Fusicornia episcopus*, n.sp., female holotype (OSUC 179113). A. Dorsal habitus; B. Lateral habitus; C. Head and mesosoma, dorsal view; D. Head and mesosoma, lateral view; E. Head, anterior view; F. Mesopleuron, lateral view. Scale bars in millimeters.
Figure 12: *Fusicornia fax*, n.sp., female holotype (OSUC 149013). A. Dorsal habitus; B. Lateral habitus; C. Head and mesosoma, dorsal view; D. Head and mesosoma, lateral view; E. Head, anterior view; F. Antennae. Scale bars in millimeters.
Figure 13: *Fusicornia fortuna*, n.sp., female holotype (OSUC 149017). A. Dorsal habitus; B. Lateral habitus; C. Head and mesosoma, dorsal view; D. Head and mesosoma, lateral view; E. Head, anterior view; F. Mesopleuron, lateral view. Scale bars in millimeters.
Figure 14: *Fusicornia indica* Mani & Sharma, female holotype. A. Dorsal habitus; B. Lateral habitus; C. Head and mesosoma, dorsal view; D. Head and mesosoma, lateral view; E. Head, anterior view; F. Head, anterior view, female (OSUC 149027). Scale bars in millimeters.
Figure 15: *Fusicornia indica* Mani & Sharma., female (OSUC 149027). A. Head and mesosoma, dorsal view; B. Head and mesosoma, lateral view. Female (OSUC 21036781). C. Head and mesosoma, dorsal view; D. Lateral habitus; E. Scutellum and metanotal spines; F. Metapleuron. Scale bars in millimeters.
Figure 16: Fusicornia indica Mani & Sharma, female (OSUC 211065). A. Dorsal habitus; B. Lateral habitus; C. Mesosoma, dorsal view; D. Mesosoma, lateral view; E. Head, anterior view; F. Antennae. Scale bars in millimeters.
Figure 17: *Fusicornia koreica* Choi & Kozlov, female (OSUC 206225). A. Dorsal habitus; B. Lateral habitus; C. Head and mesosoma, dorsal view; D. Head and mesosoma, lateral view; E. Head, anterior view; F. Metapleuron lateral view. Scale bars in millimeters.
Figure 18: *Fusicornia paradisa*, n.sp., female holotype (OSUC 206350). A. Dorsal habitus; B. Lateral habitus; C. Head and mesosoma, dorsal view; D. Head and mesosoma, lateral view; E. Head, anterior view; F. Mesoscutellum and T1, dorsal view. Scale bars in millimeters.
Figure 19: *Fusicornia paradisa*, n.sp. A. Lateral habitus, female (OSUC 206278); B. Mesoscutellum and T1, female (OSUC 206278); C. Lateral habitus, female (OSUC 148989); D. Mesoscutellum and T1, female (OSUC 206274); E. Lateral habitus, female (OSUC 206274); F. Mesoscutellum and T1, female (OSUC 148986). Scale bars in millimeters.
Figure 20: *Fusicornia plicata*, n.sp., female holotype (OSUC 206285). A. Dorsal habitus; B. Lateral habitus; C. Head and mesosoma, dorsal view; D. Head and mesosoma, lateral view; E. Head, anterior view; F. Mesoscutellum and T1, dorsal view. Scale bars in millimeters.
Figure 21: *Fusicornia sabrina*, n.sp., female holotype (OSUC 208106). A. Dorsal habitus; B. Lateral habitus; C. Head and mesosoma, dorsal view; D. Head and mesosoma, lateral view; E. Head, anterior view; F. Metanotal spine and T1. Scale bars in millimeters.
Figure 22: *Fusicornia skopelos*, n.sp., female holotype (CASENT 2042207). A. Dorsal habitus; B. Lateral habitus; C. Head and mesosoma, dorsal view; D. Head and mesosoma, lateral view; E. Head, anterior view; F. Mesoscutal humeral sulcus. Scale bars in millimeters.
Figure 23: *Fusicornia speculum*, n.sp., female holotype (CASENT 8106183). A. Dorsal habitus; B. Lateral habitus; C. Head and mesosoma, dorsal view; D. Head and mesosoma, lateral view; E. Head, anterior view; F. Gena, lateral view. Scale bars in millimeters.
Figure 24: *Fusicornia spinosa* (Risbec), female (OSUC 211169). A. Dorsal habitus; B. Lateral habitus; C. Head and mesosoma, dorsal view; D. Head and mesosoma, lateral view; E. Head, anterior view; F. Mesopleuron lateral view. Scale bars in millimeters.
Figure 25: *Fusicornia tehrii* Mukerjee, female (OSUC 149008). A. Dorsal habitus; B. Lateral habitus; C. Head and mesosoma, dorsal view; D. Head and mesosoma, lateral view; E. Head, anterior view; F. Mesoscutellum and metanotal spine dorsal view. Scale bars in millimeters.
Figure 26: *Fusicornia noonae* Buhl, male holotype (new synonymy of *F. tehrii*). A. Dorsal habitus; B. Lateral habitus; C. Head and mesosoma, dorsal view; D. Head, anterior view. Scale bars in millimeters.
REFERENCES


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