

# *Ceratosolen ramirezi*, a new fig wasp from the Philippine *Ficus rivularis*: a prediction come true (Hymenoptera: Agaonidae)

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*Abstract:* *Ceratosolen ramirezi* spec. nov., a fig wasp from *Ficus rivularis* Merrill, is described from the Philippines. The classification of some species of *Ceratosolen* is discussed in comparison with that of their host figs.

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## Introduction

Figs and fig insects are supposed to have evolved together, and one expects to find the classification of the figs to be reflected by that of their pollinating fig insects (Wiebes, 1963: 99-106). This should not be taken for granted, but be proven by independent studies of figs and fig wasps.

Corner, in his revision of the Indo-Australian species of *Ficus* L. (see Corner, 1965), recognized four subgenera. *Ficus racemosa* L., the host of *Ceratosolen fusciceps* (Mayr), is the only Indo-Australian representative of the predominantly African subgenus *Sycomorus* (Gasp.) Miq.: all have species of *Ceratosolen* Mayr as pollinators (Wiebes, 1989, table 1). Some related Indo-Australian species of *Ceratosolen* are associated with figs of section *Neomorpha* King, others with section *Sycocarpus* Miq., and also some with section *Adenosperma* Corner. All these sections were classified by Corner in the subgenus *Ficus*. One species of fig from the Philippines (*F. pseudopalma* Blanco with *Ceratosolen bakeri* Grandi as pollinator), was classified in the same subgenus *Ficus*, but in the nominate section (and subsection, series *Pseudopalmeae* Corner), close to *F. carica* L. (with *Blastophaga psenes* (L.) as pollinator).

Ramirez (1974: 780, table 2; 1977: 303, 305, table 3) transferred all sections and series of

*Ficus*, supposedly pollinated by *Ceratosolen*, to subgenus *Sycomorus*. Corner (1978: 378) did not find any botanical explanation. Later, Berg (1990: 182) would take *Sycomorus*, *Sycocarpus* and *Neomorpha* together on the basis of botanical characters, but *Adenosperma* and the *Pseudopalmeae* were not included. Also not the *Rivulares*, although Ramirez (1974) had predicted that *Ficus rivularis* Merrill, because of its close resemblance to *F. pseudopalma*, but classified in another series (*Rivulares* Corner), would have a species of *Ceratosolen* as pollinator. In 1989, Ramirez did collect the pollinator of *Ficus rivularis*, which is here described as a new species, indeed of *Ceratosolen*. It is a pleasure to name it to William Ramirez. In considering the broad outlines, and looking beyond the available data, he gave inspiring contributions to fig wasp biology.

Corner (1969: 326-328) discussed *F. pseudopalma* and its resemblance to *F. dammaropsis* Diels (host of *C. abnormis* Wiebes), and *F. rivularis* and its resemblance to figs of section *Adenosperma*: “[*Ficus rivularis*] appears to be a relic, fitting no section, of the ancestral line of sect. *Ficus* from which [that of] *Adenosperma* diverged”. Corner’s fig. 5, showing the relationships between the sections *Ficus*, *Adenosperma* and *Sycocarpus*, can be compared

with the cladogram for the subgenus *Sycomor* by Ramirez (1981, fig. 2) and with the classification of the species-group of *Ceratosten armipes* Wiebes (1963, 1981): see fig. 1. The subsections of *Sycocarpus* associated with this species-group of *C. armipes* are taken together as "subsections", the species-groups of *Ceratosten* from the nominate subsection *Sycocarpus* as "various". The main differences are found in the position of the *Rivulares* (not really classified in Corner's diagram); that of the *Rivulares* and *Pseudopalmeae*, taken together, as against that of the "subsections"; and the combination of *Neomorpha* and *Sycomor*-wasps, but not the figs: both Corner and Ramirez classified *Neomorpha* with *Sycocarpus* rather than with *Sycomor*. The fig wasps of *Ficus pseudopalma* and *F. rivularis* resemble that of *F. theophrastoides* Seem., i.e., *Ceratosten vissali* Wiebes, which is a member of the *C. armipes*-group.

***Ceratosten ramirezi* spec. nov.**  
(figs. 2, 3, 5, 6)

*Type material*

2 ♀ 15 ♂, Philippines, Luzon, U.P. Land grant Quezon, Botanical Garden, ex *Ficus rivularis* Merr., leg. W. Ramirez, 29.x.1989 (♀ holotype, 15 ♂) and 13.xii.1989 (1 ♀, foundress). Holotype: ♀. Paratypes: 1 ♀ 15 ♂. All types are kept in the collection of the Nationaal Natuurhistorisch Museum, Leiden, The Netherlands, nos. 5116 (♀ holotype and 15 ♂) and 5118 (1 ♀ foundress).

**Description**

Female: Head (fig. 2) shorter than wide across the compound eyes (ratio 0.85), the longitudinal diameter of the eye is 1.5 times as long as the cheek. There are three ocelli. The epistomal margin has three lobes, subequal in length, the median one of which is pointed, the lateral are wider and more angular in outline. The antennal scape is robust; the pedicel bears ca. seventy antiaxial spines; the funicular segments are more slender than those of *C. bakeri*: e.g., the sixth is fully three times as long as wide, bearing four rows of oblong sensilla (*C. bakeri*: two times, three rows). The mandible has one apical tooth and a small subapical one; the appendage has seven ventral lamellae. The maxilla bears a short bacilliform process (one-fifth of the length of the maxilla), with a long apical seta. Although Grandi (1927) did not mention it for *C. bakeri*, also there a (small) bacilliform process is present.

The thorax has large pollen pockets. The fore wing (length: width, 11 : 5) is 2.2 mm long; the submarginal, marginal, stigmal, and postmarginal veins are approximately in ratio 12 : 4 : 4 : 7; the hind wing (9 : 2) is 1.3 mm long. The fore tibia has a dorso-apical comb of five teeth; the ventral spur is somewhat shorter than the first tarsomere; the tarsal segments are in ratio 7 : 6 : 4 : 6 : 10. The mid tarsi are in ratio 16 : 8 : 8 : 7 : 11. The hind tibia has a

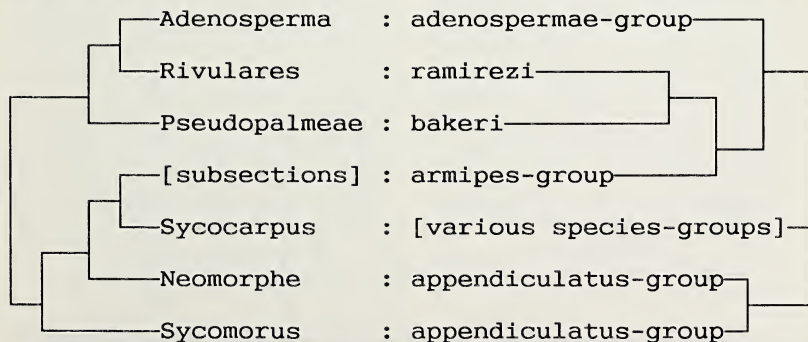


Fig. 1. A cladogram (left) for (most of) subgenus *Sycomor*, according to Ramirez (1981, fig. 2), compared with a cladogram (right) for the species and species-groups of *Ceratosten*, according to Wiebes (1963, 1981). Ramirez did not distinguish the "subsections" of *Sycocarpus*, which have the *C. armipes*-group as pollinators.

tridentate antiaxial tooth and a more simple axial one; the tarsal segments are in ratio 14 : 7 : 5 : 4 : 7.

The gaster has very large peritremata of the stigmata. The hypopygial spine (fig. 3) is short and blunt, and it bears a pair of long lateral setae and a row of ca. seven rather large, hyaline setae.

The length of the head, thorax and gaster is ca. 2.4 mm; the valves of the ovipositor are one-seventh of the length of the gaster. The colour is dark brown; head and body are covered with long setae, and also the wings are pubescent, with dark striae.

Male: Head (fig. 6) ca. 1.3 times as long as wide; there are very small eyes at half length. The median tooth of the trilobate epistomal edge is not very prominent; the antennal grooves are rather wide, and open over their whole length. The antenna (fig. 5) has five segments as, different from the situation in *C. bakeri* (fig. 4) which it otherwise resembles,

the funicle has only two segments; there is one anellus (not shown). The mandible has two teeth; the maxillae are bilobate.

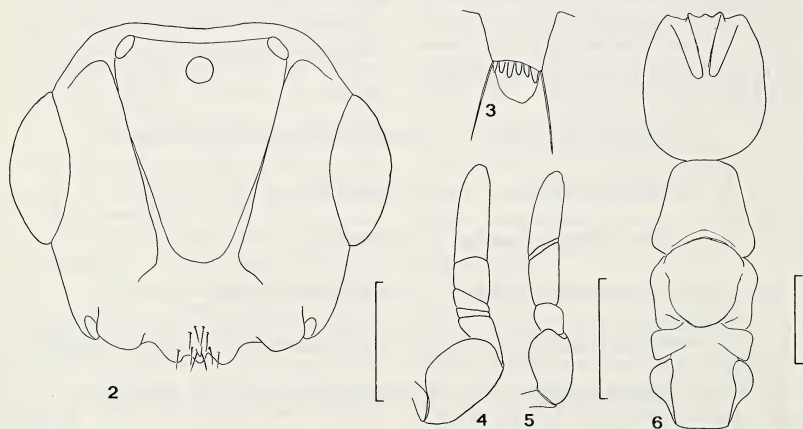
The thorax (fig. 6) is more slender than that of *C. bakeri* and also different in the structure of the mesonotum, in which a scutellum is visible; the propodeum is not quite as wide as long (0.8), while in *C. bakeri* this ratio is ca. 0.4; in both species the peritremata of the stigmata are very large. The fore tibia has a dorso-apical comb of three teeth; the four tarsal segments are in ratio 12 : 4 : 3 : 9. The mid tarsi are in ratio 5 : 2 : 2 : 3 : 6. The hind tibia has a tridentate crest, as in *C. bakeri*; the tarsal segments are in ratio 10 : 3 : 3 : 4 : 6.

The genitalia are simple.

The length of the head and thorax is ca. 1.7 mm. The colour is yellow-brown.

#### Identification

The new species keys out (Wiebes, 1981: 367, no. 7 for the females and no. 10 for the males)



Figs. 2, 3, 5, 6. *Ceratosolen ramirezi* spec. nov. 2, outline of female head, dorsal aspect (pubescence omitted) (scale 0.5 mm); 3, spine of the hypopygium, ventral aspect (scale 0.25 mm); 5, male antenna, dorsal aspect (scale 0.25 mm); 6, outline of male head and thorax, dorsal aspect (scale 1.0 mm).

Fig. 4. *Ceratosolen bakeri* Grandi, male antenna, dorsal aspect (scale 0.25 mm).

with *Ceratosolen bakeri* Grandi and *C. vissali* Wiebes, from which it can be distinguished by the following key. In the old key, a mistake should be corrected: erroneously, the alternatives of couplet 4 were interchanged!

1. Females ..... 2
- Males ..... 4
2. Eye approximately as long as the cheek.  
Sixth antennal segment 2.5 times as long as wide ..... *vissali* Wiebes
- Eye approximately 1.5 times as long as the cheek ..... 3
3. Sixth antennal segment approximately two times as long as wide, bearing three rows of sensilla ..... *bakeri* Grandi
- Sixth antennal segment approximately three times as long as wide, bearing four rows of oblong sensilla ..... *ramirezi* Wiebes
4. Fore tibia with three teeth in the dorso-apical comb. .... 5
- Fore tibia with four teeth in the dorso-apical comb. .... *bakeri* Grandi
5. Hind tibia with a bicuspidate antiaxial crest ..... *vissali* Wiebes
- Hind tibia with a tricuspidate antiaxial crest ..... *ramirezi* Wiebes

## References

- BERG, C. C., 1990. Reproduction and evolution in Ficus (Moraceae): traits connected with the adequate rearing of pollinators. – *Mem. New York Bot. Gdn.* 55: 169-185.
- CORNER, E. J. H., 1965. Check-list of Ficus in Asia and Australasia, with keys to identification. – *Gdns' Bull. Sing.* 21: 1-186.
- CORNER, E. J. H., 1969. Ficus sect. Adenosperma. – *Phil. Trans. R. Soc.* 256: 319-355.
- CORNER, E. J. H., 1978. Ficus dammaropsis and the multibracteate species of Ficus sect. Sycocarpus. – *Phil. Trans. R. Soc.* 281: 373-406.
- GRANDI, G., 1927. Hyménoptères sycophiles récoltés aux Iles Philippines par C. F. Baker, i. Agaonini. – *Philipp. J. Sci.* 33: 309-329.
- RAMIREZ, W., 1974. Coevolution of Ficus and Agaonidae. – *Ann. Missouri Bot. Gdn.* 61: 770-780.
- RAMIREZ, W., 1977. A new classification of Ficus. – *Ann. Missouri Bot. Gdn.* 64: 296-310.
- RAMIREZ, W., 1981. Evolution of the monoecious and dioecious habit in Ficus (Moraceae). – *Brenesia* 18: 207-216.
- WIEBES, J. T., 1963. Taxonomy and host preferences of Indo – Australian fig wasps of the genus *Ceratosolen* (Agaonidae). – *Tijdschr. Ent.* 106: 1-112.
- WIEBES, J. T., 1981. The species-group of *Ceratosolen arripes* Wiebes (Hymenoptera Chalcidoidea, Agaonidae). – *Proc. K. ned. Akad. Wet. (C)* 84: 365-377.
- WIEBES, J. T., 1989. Agaonidae (Hymenoptera Chalcidoidea) and Ficus (Moraceae): fig wasps and their figs, iv (African *Ceratosolen*). – *Proc. K. ned. Akad. Wet. (C)* 92: 251-266.

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