TWO NEW SPECIES OF *PSEUDIASTATA* (DIPT., DROSOPHILIDAE) PREDACIOUS ON THE PINEAPPLE MEALYBUG.

BY

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Reprinted from the BULLETIN OF ENTOMOLOGICAL RESEARCH, Vol. 41, Part 3, *February*, 1951.

LONDON:
COMMONWEALTH INSTITUTE OF ENTOMOLOGY,
41, QUEEN'S GATE, S.W.7.

ILFORD:
PRINTED BY SOUTH ESSEX RECORDERS, LTD.

1951

TWO NEW SPECIES OF *PSEUDIASTATA* (DIPT., DROSOPHILIDAE) PREDACIOUS ON THE PINEAPPLE MEALYBUG.

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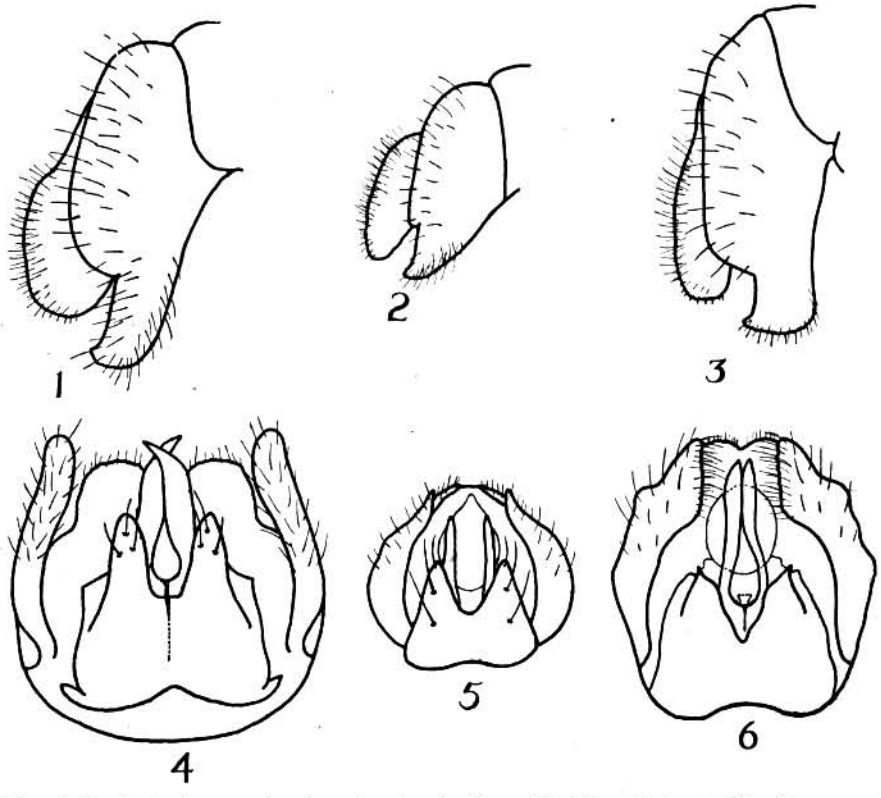
The genus *Pseudiastata* was described by Coquillett (1908) for a single species from Maryland, *P. nebulosa*, which he placed in the family GEOMYZIDAE. Melander (1913b) referred it to the DROSOPHILIDAE and he has been followed in this by subsequent workers. The convergent anterior frontal bristles are suggestive of MILICHIIDAE, however, and the genus may run to that family in some keys.

For many years, the genus was known only from the holotype of *nebulosa* and another specimen from Panama (Sturtevant, 1921). Subsequently, a species identified as *nebulosa* was investigated in Central America and introduced into Hawaii as a biological control against the pineapple mealybug, *Pseudococcus brevipes* (Ckll.) (Fullaway, 1933 ; Carter, 1935). In 1937, Costa Lima described a second species as *Pseudiastata brasiliensis*, also predacious on *Pseudococcus brevipes*.



Figs. 1–3.—Lateral aspect of male terminalia : (1) *P. nebulosa* ; (2) *P. vorax* ; (3) *P. pseudococcivora.*

Figs. 4–6.—Anterior aspect of male terminalia : (4) *P. nebulosa* ; (5) *P. vorax* ; (6) *P. pseudococcivora.*

Recently a series from Trinidad was submitted for study through the kindness of Dr. F. van Emden of the Commonwealth Institute of Entomology, and a critical review of this material and of other available examples in conjunction with the type of *nebulosa* revealed the existence of two undescribed species. Both of the latter species were also reared from larvae predacious on the pineapple mealybug, *Pseudococcus brevipes*. The holotype of *Pseudiastata nebulosa* was collected at light, and the larval habit of this species (s. str.) has never been discovered.

Adults of the four species before me are virtually indistinguishable on superficial characters. Differences in the wing markings are apparently only variations in extent and intensity, and the fundamental pattern of all four species is the same (fig. 7). Males can be separated by comparison of the lateral and anterior aspects of the terminalia (figs. 1–6), but females can be identified only by association with males, as far as can be determined at present. *Pseudiastata brasiliensis*, known to me only from the description, is easily distinguished by the wing pattern (fig. 8).

Pseudiastata Coquillett.

Coquillett, 1908, Proc. ent. Soc. Wash., **9,** p. 148 ; Melander, 1913, J.N.Y. ent. Soc., **21,** p. 289 ; Melander, 1913, Psyche, **20,** p. 167 ; Sturtevant, 1921, Publ. Carnegie Instn, no. 301, p. 55 ; Malloch & McAtee, 1924, Proc. biol. Soc. Wash., **37,** pp. 30–31 ; Duda, 1924, Arch. Naturgesch., (A) **90** (3) pp. 175, 178.

Eye bare, large, occupying most of head in profile, the cheek linear ; front with numerous short hairs ; occiput decidedly concave ; arista microscopically pubescent ; thorax densely covered with hairs not arranged in definite rows ; scutellum (except for bristles), mesopleuron, and pteropleuron bare ; legs short, at least some tibiae with preapical dorsal bristles ; wing pictured, venation and colour pattern as figured (fig. 7), costa fractured twice, with a strong bristle before each break, costa extending to fourth vein, discal and second basal cells confluent, anal cell present but small. Chaetotaxy : 1 inner and 1 outer vertical, cruciate postverticals (short), cruciate ocellars (short), 3 fronto-orbital (anterior pair convergent, the two posterior pairs reclinate), 1 humeral, 1 presutural, 1+1 notopleural, 1 strong supraalar, 2 postalar, 2 posterior dorsocentral, 1 prescutellar acrostichal, 2 scutellar, 2 sternopleural.

Pseudiastata nebulosa Coquillett.

Male terminalia as figured (figs. 1, 4), the ninth tergite strongly produced ventrad on each side as a " genital forceps," each lobe obviously longer than broad and not tapering, the sides approximately parallel up to the somewhat rounded apex ; in anterior aspect, flanking the midline, are two thumb-like processes (anterior claspers ?), each of which bears three distinct bristles.

Holotype male : Plummer's Island, Maryland, 1.viii.1902, *H. S. Barber*, taken at light (U.S. National Museum).

One female : Perry, Georgia, 13.iv.1938, *P. W. Fattig* (U.S. National Museum) is probably this species.

Pseudiastata pseudococcivora, sp. n.

Male terminalia as figured (figs. 3, 6), the ninth tergite strongly produced ventrad on each side, the genital forceps so formed being approximately as broad as long, not tapering, and distinctly subtruncate, an appearance especially evident in the anterior aspect ; in anterior aspect, the two processes flanking the midline are relatively short and acute, without bristles.

Holotype male, allotype, and eight paratypes : (5 ♂♂, 3 ♀♀), Panama Canal Zone, April, June, and July, 1924 (*D. T. Fullaway*), reared from larvae predacious on

pineapple mealybug ; 1 ♂ paratype, " Mexico ", intercepted in quarantine at Laredo, Texas, 24.i.1942. Types and paratypes in the U.S. National Museum (Type No. 59179) ; 2 paratypes (♂, ♀) in the British Museum (Nat. Hist.)

Four puparia with the Canal Zone series curiously resemble the sub-hemispherical, molluscoid puparium of the Syrphid genus *Microdon*, flat below, moderately convex above, oval in outline as seen from above, the spiracular slits on two short, dark red, polished, slightly diverging and slightly swollen processes. The general appearance is like that of *P. brasiliensis*, as figured by Gonçalves (1939).

This is undoubtedly the species which was introduced (as *P. nebulosa*) into Hawaii on several occasions between 1924 and 1932 for the control of the pineapple mealybug (Fullaway, 1933). It may also have been the species reported by Carter (1935) as very abundant throughout Guatemala except in the highlands, feeding voraciously on the same species of mealybug.

One female : Alhajuelo, Panama, 19.iv.1911, *August Busck* (U.S. National Museum), which was recorded as *Pseudiastata nebulosa* by Sturtevant (1921), is probably *pseudococcivora*, but in the absence of associated males it is not included in the type series.

Pseudiastata vorax, sp. n.

Male terminalia as figured (figs. 2, 5), the ninth tergite rather weakly produced ventrad, each lobe tapering and subconical ; in anterior aspect, the two processes flanking the midline are strongly conical, each with two long, dark, conspicuous, widely spaced bristles, and a weak, indistinct subapical bristle.

Holotype male : allotype, and four paratypes (1 ♂, 3 ♀♀), River Estate, Trinidad, British West Indies, January, 1948 (*T. W. Kirkpatrick*), " On *Ps. brevipes* on cacao." Type series returned to the Commonwealth Institute of Entomology, the type to be deposited in the British Museum (Nat. Hist.) ; 2 paratypes (♂, ♀) in the U.S. National Museum.

Two puparia associated with the specimens, including one adhering to a piece of plant tissue, are of the same curious, *Microdon*-like form as those described under the preceding species.

Pseudiastata sp.

One male : near Morenos, Pernambuco, Brazil, 4.xii.1931, *M. Kisliuk* and *C. E. Cooley*, " on guava " (U.S. National Museum).

This specimen is very close to *P. vorax* in the form of the male genitalia, especially in lateral aspect, but there is a doubling of the bristles on the anterior processes. A fourth species may be involved, but I shall merely record it here until such time as adequate material is available. The wing pattern is like that of the three preceding species (fig. 7), and not as figured for *P. brasiliensis* Costa Lima.

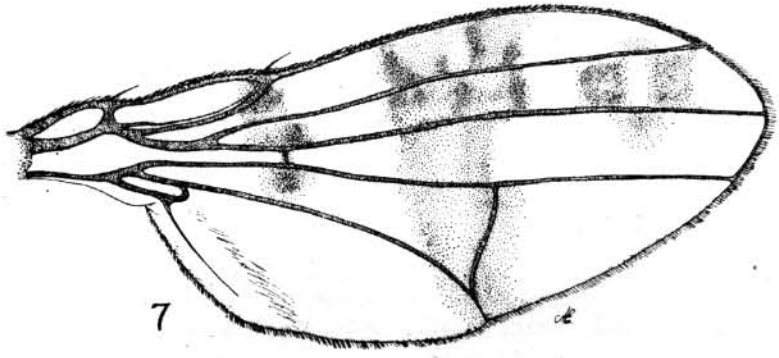
Pseudiastata brasiliensis Costa Lima.

Costa Lima, 1937, Chacaras e Quintaes, **55** (2) pp. 179–182, 6 figs. ; Figueiredo, jr., 1938, Biologico, **4** (6) pp. 206–207, 4 figs. ; Gonçalves, 1939, Physis, **17** pp. 103–112, 15 figs.

The male genitalia were not described for *brasiliensis*, and consequently it cannot be compared with the preceding species in that respect. Further, the differences pointed out by Costa Lima in the orbital, tibial, and costal bristles, based only on the descriptions of *nebulosa* by Coquillett and Sturtevant, do not seem to be sufficiently distinct when the holotype of *nebulosa* is compared with the detailed figures given by Costa Lima for *brasiliensis*. With reference to the costal bristles, the description by

Sturtevant is unfortunately misleading, the words proximal and distal being reversed, a *lapsus* which naturally led Costa Lima to use it as one of the significant distinctions between *nebulosa* and his species.

Despite the lack of differences in the above points, however, the pattern of infuscation on the wings appears amply to justify separate specific status for *brasiliensis* (fig. 8). The three photographs of the wings by Costa Lima, and the later drawing by Figueiredo, show clearly that the wings are much more extensively maculated in *brasiliensis* than in the preceding species, and well beyond the range of variation in those species. There are three to five bars or narrow crossbands in the discal cell proximad of the spot which encloses the hind crossvein, a series of three or four



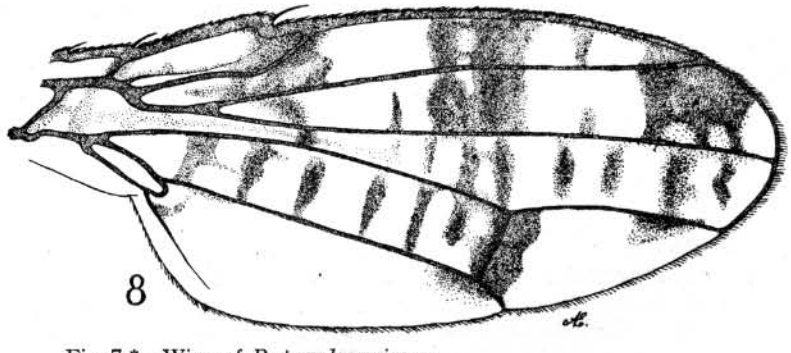


Fig. 7.*—Wing of *P. pseudococcivora.*
Fig. 8.*—Wing of *P. brasiliensis* (♂) (redrawn from Gonçalves).
*By Miss Addie Egbert.

crossbands in the apical cell distad of the level of the hind crossvein, and a narrow crossband in the marginal cell between the broad median and apical bands. In females, the infuscation is more extensive than in the males, and the banded effect is not so pronounced. In all of the preceding species, those areas are predominantly hyaline, with only one roundish spot in the discal cell opposite the small crossvein, and a similar spot in the apical cell as a continuation of the main outer band of infuscation (*cf.* fig. 7).

Pseudiastata brasiliensis was described from flies reared from larvae predacious on *Pseudococcus brevipes* on the grass, *Eriochloa punctata,* in pineapple plantings in the

state of Rio de Janeiro, Brasil. Figueiredo (1938) has described and figured the larva and puparium, as well as the adult, and Gonçalves (1939) has given particularly detailed descriptions and figures for all stages.

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Printed under the authority of His Majesty's Stationery Office
by the South Essex Recorders, Ltd., Ilford.

(82) Wt. P2469/3865 130 3/51 S.E.R. Ltd. Gp. 432