

New Ichneumonidae, parasitic upon the rice borer *Rupela albinella* (Cr.) (Lep., Pyralidae) in Surinam, with a key to the species of *Strabotes* (Hym., Ichneumonidae)

by

K. W. R. ZWART

Dept. of Entomology, Agric. University, Wageningen, The Netherlands.

Abstract: *Venturia ovivenans* nov. spec. and *Strabotes rupelae* nov. spec. are described. Both were reared from the rice stem borer *Rupela albinella* (Cr.) in Surinam (Sth. America). *Strabotes abdominalis obscurus* nov. subspec. is described from Columbia and a key is given to the known species of the Neotropic genus *Strabotes* Townes.

1. Introduction

In a preliminary study of the parasites of rice borers in Surinam (Sth. America) — made during a stay at the Centre for Agricultural Research in Surinam (CELOS) — I reared two ichneumonid species from *Rupela albinella* (Cr.) that appeared to be new. Dr. HENRY TOWNES (i.l. 10 XII 1968), who saw both species, kindly informed me that one of them belonged to a new genus, that he was going to describe in his treatment of the genera of Ichneumonidae as *Strabotes*. As this name was not yet published, I reported the species as “probably conspecific with ‘*Ischnoceros*’ *abdominalis*”, and the other as *Venturia* n.s. (ZWART, 1969). A careful study of the material of *Strabotes*, however, led me to consider the Surinam specimens as representing an undescribed species very closely related to *Strabotes abdominalis*.

Recently, HUMMELEN (1974) made a careful study of the relationship between *Rupela* and its larval parasites in Surinam. On my request, most specimens that he reared from March 1971 up to May 1972 were preserved in alcohol. The present study includes this material.

2. *Venturia ovivenans* nov. spec. (figs. 1—3)

Venturia n.s.; ZWART, 1969; Celos bull. 8: 20.

Female:

Length 8.5—11 mm, front wing 5—6 mm.

Head and thorax black; densely punctate and covered with dense white hairs; hairs on frons, vertex and mesoscutum shorter; occiput shining and hairless. Punctures on vertex and apical part of clypeus separated by about or slightly less than their diameter, with clear microsculpture between; frons, face and temples denser punctate, only frons with clearly visible microsculpture.

Head broadened behind the eyes, broader at temples than at the eyes. Occipital carina reaching very high dorsally, in side view to level of lateral ocelli. The vertex between lateral ocelli and occipital carina thus rather horizontal. Temples very broad. Malar space (= shortest distance from upper corner of mandible to the eye) 0.4 as long as width of mandibular base. Eyes somewhat divergent ventrad, very weakly indented just above antennal socket. Antennae long, if bent backwards, reaching to about end of tergite 3; flagellum with 41—46 segments (median

number on 20 specimens 43.4), all segments longer than wide. Upper tooth of mandible slightly longer than lower tooth.

Epomia present; punctation on pronotum merging into rugulosity, but not clearly striate as in the well known *V. canescens*; rest of thorax very densely punctate (denser than in *V. canescens*), except for the speculum. Sternaulus absent and notaulus weakly impressed. Propodeum nearly completely areolated, first and second pleural areas united; areola closed behind, convergent behind costulae; carinae at apex of propodeum somewhat obscured; punctation dense, in apical half rugose but not clearly transversely striate; apex of propodeum reaching to middle of hind coxa or a little beyond. Thorax + propodeum comparatively very long (fig. 1).



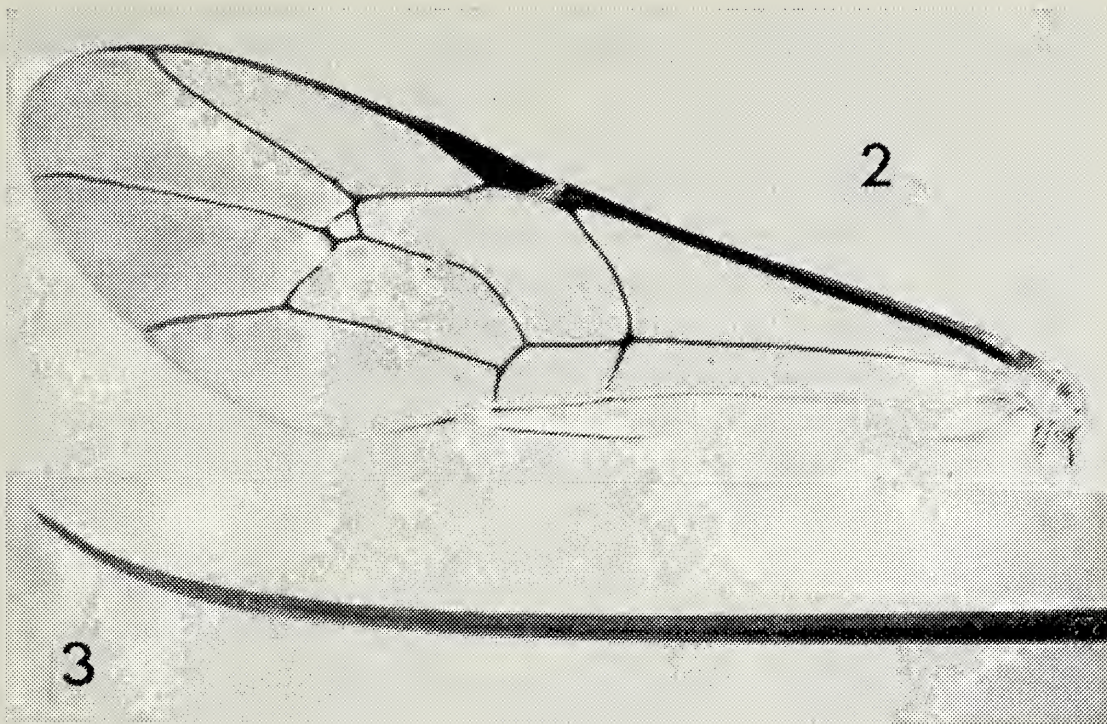
Fig. 1. *Venturia ovivenans* n.s., female paratype.

Tarsal claws pectinate.

Front wing with areolet well developed; nervulus opposite basal vein or tending to be distad of this (fig. 2); nervellus intercepted at lower 0.3.

Cylindric section of first gastral segment about 4 times as long as deep. Ovipositor extremely slender, gradually tapering from base to apex, basically straight, up-curved only near its tip; the notch hardly visible (fig. 3); ovipositor sheath about 1.1 as long as hind tibia. (The extremely slender apex of the ovipositor may be considered as an adaptation to the habit of the species to ovoposit in the eggs of its host.)

Head and thorax black; antennae ventrally rufous, dorsally darker; scape and pedicel ventrally yellow; scape dorsally and medially yellowish, often with a more or less developed dark marking, laterally always dark marked. Mandibles yellow, with dark brown teeth. Palpi yellow, like tegula. Front and middle legs pale rufous



Figs. 2—3. *Venturia ovivenans* n.s.: 2, front wing; 3, tip of ovipositor.

with the trochanters yellow and tarsi somewhat darker. Hind coxa black, yellow at the apex; hind trochanters yellow; hind femur red, hind tibia ventrally red, dorsally usually brownish like tarsus. Petiolus black, postpetiolus red. Rest of abdomen red with black markings on basal half of tergite 2 and basal $1/3 \pm$ of tergite 3; tergite 7 usually infusate at base. Ovipositor sheath black.

Male:

Like female; the main difference is found in colour pattern of abdomen.

Postpetiolus sometimes partly or completely black; tergite 2 sometimes more than basal half back; tergite 3 often completely blackish or at least infusate at base and at apex, tergites 5, 6, 7 and 8 nearly always largely infusate dorsally at base.

The scape dorsally often infusate; flagellum with 39—45 segments. Length 9—12 mm.

Holotype: ♀, Surinam, near Paramaribo, reared from *Rupela albinella*, cocoon collected 22 XI 1968 in rice stem on CELOS - Res. Station, K. W. R. ZWART. Adult emerged 29 XI 1968 (ZWART).

Paratypes: (209 ♂, 157 ♀) All from Surinam. 202 ♂, 143 ♀, reared from *Rupela albinella* at CELOS — Res. Sta. near Paramaribo. The majority of these during March 1971 — May 1972 by P. J. HUMMELEN. An other lot during Oct. 1968 — Jan. 1969 by K. W. R. ZWART. (Paratypes of these will be deposited in the following collections: ZWART, Wageningen, Leiden, TOWNES, Washington, Ottawa, London, Berlin. — Other data are: 3 ♂, 2 ♀, reared from *Rupela albinella*, Wageningen - Rice - Scheme (Surinam), emerged on 20 IV, 27 IV and 15 V 1959, J. VAN DINTHER (Wageningen). 1 ♀, nr. Paramaribo, 18—23 XII 1963, D. C. Geijskes (TOWNES). 2 ♀, CELOS-Res. Sta. nr. Paramaribo, along Kasabaholo-rivulet, 11 IX and 18 XI 1968, K. W. R. ZWART (ZWART). 13 ♂,

1 ♀, CELOS-Res. Sta., in rice field, 16 X, 28 X, 13 XII 1968 and Jan. 1969, K. W. R. ZWART (ZWART). 1 ♀, CELOS building, against window, 17 XII 1968, K. W. R. ZWART (ZWART).

The specific name is from ovum (egg) and venari (hunting for) and refers to the habit of the parasite to oviposit in the egg masses of its host. As far as I know this is extraordinary for species of the subfamily Porizontinae.

I did not see specimens from outside Surinam, but KENNARD (1965) mentions *Idechthis* spec. as a parasite of *Rupela albinella* in (Br.) Guyana. It is very likely that this is the same species. I have seen an undescribed species in the TOWNES collection (spec. 54) that seems to be closely related to *Venturia ovivenans*.

3. *Strabotes* Townes

The genus was recently described by TOWNES (1970, p. 281), who also included keys to the related genera. *Strabotes* was based upon one species, *Ischnoceros abdominalis* Cresson, from Cuba. Material was known from two other localities, viz. Columbia and Surinam, and TOWNES (l.c.) suggested that this represented different subspecies.

I was able to study the material from the TOWNES collection. Although there is a great resemblance, the Surinam specimens differ constantly from the others by some structural characters. They can therefore be best treated as a separate, but very closely related species. Both species have the same basic colour pattern which varies greatly, especially in *S. rupelae* n.s.. As the Cuban material has much more extensive white markings than any of the Columbian specimens, I agree with TOWNES that they represent different subspecies. The three known taxa can be differentiated as follows.

KEY

1. Anterio-ventral surface of pronotum with dense punctation all over (fig. 5); no smooth area. Punctation on postero-dorsal surface merging into rugulosity, sometimes into irregular striation. Centre of temple with dense punctation, punctures rather deep, separated by their diameter or less (fig. 6). Female front wing bifasciated *S. rupelae* n. sp.
- Anterio-ventral surface of pronotum smooth, without punctation except for the extreme front edge (fig. 7). Upper margin of pronotum with clearly separated punctures (fig. 7). Below upper margin strongly sculptured with undulating lines, without punctation between. Punctures in centre of temple very shallow, separated by several times their diameter (fig. 8). Female front wing rather uniformly dusky, the apex slightly darker . . . *S. abdominalis* Cresson (2)
2. Females 3
- Males 4
3. Orbits broadly white, except for short interruption near clypeus. White on collar extending downward until about 2/3 the distance towards lower corner of pronotum; tegula, subtegular ridge, two lines on mesoscutum, upper part of metapleurum, and other parts white . . *S. abdominalis abdominalis* Cress. ♀.

- Only widely interrupted white marks on frontal and temporal orbits. Less white on collar; tegula, subtegular ridge, mesoscutum and upper part of metapleurum not, or only faintly marked with white . . . *S. abdominalis obscurus* n. ssp. ♀.
- 4. Face completely, and most of the temple, white; a separate white area behind mandible, extending from mandible beyond junction of oral and genal carinae. Seventh tergite not marked with white . . . *S. abdominalis abdominalis* Cress. ♂.
- Face not completely, and temple less marked with white; no white behind mandible. Seventh tergite broadly white at apex
S. abdominalis obscurus n.ssp. ♂.

3.1. *Strabotes rupelae* nov. spec. (figs. 4—6)

prob. "*Ischnoceros*" *abdominalis* Cress.; ZWART, 1969.

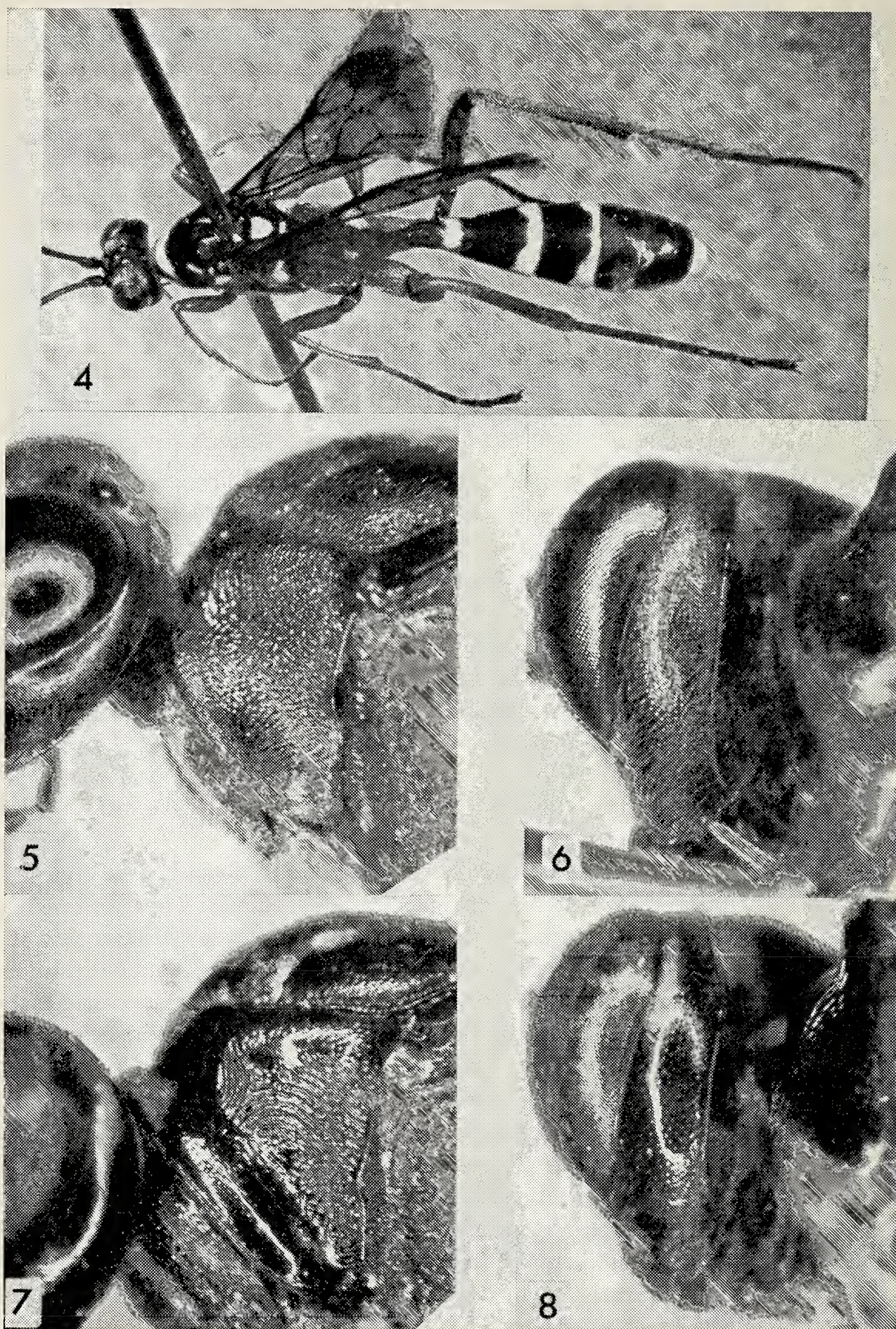
F e m a l e :

Length 6.6—11.8 mm, excluding ovipositor sheath of 1.5—3.0 mm; front wing 6.0—8.8 mm.

Head black; usually with whitish markings on frontal orbit and on upper part of temporal orbit. These markings sometimes rather faint (reddish) or rarely completely absent. Labrum often white, but sometimes very dark. Mandibles generally brown, often red with darker teeth. (No white markings on face or clypeus). Flagellum with 23—26 segments — (usually 24 or 25; mean number on 30 specimens: 24.8) — with a white annulus on segments (5)6—9 (segment 5 sometimes partly white; segment 9 at least partly, sometimes completely white). Temple with rather dense punctation in the centre; the punctures separated by about their diameter (fig. 6); with a clear reticulation between the punctures.

Thorax black, with white markings as indicated below. Anterio-ventral surface of pronotum densely punctate; punctation on posterior-dorsal surface merging into rugulosity and sometimes forming irregular striation (fig. 5). Collar densely punctate, dorsally white. (The white colour not extending down beyond the level of epomia). Upper margin of pronotum black, sometimes with clear white marking extending from posterior corner about half the distance to the notaulus. Sometimes a reddish rudiment of this marking is present. Mesoscutum densely punctate; notaulus sharp, reaching beyond centre; in the centre between the notauli rugose or faintly longitudinally striate; just lateral to this area sometimes a short and narrow longitudinal white stripe which is mostly wanting. Mesopleurum densely punctate except for the large smooth speculum. Prepectal carina extending to or nearly reaching subtegular ridge. Scutellum with clear, although rather widely spaced punctures; completely or largely white; if white area is restricted, the base and tip of scutellum are darkened. Postscutellum rarely white. Upper part of metapleurum sometimes completely white; usually with at least some whitish colouration but rarely completely black. Basal transverse carina of propodeum complete, as are basal parts of median longitudinal carinae. Apical transverse carina represented by two very short crests. These crests nearly always, and usually the area surrounding them, white.

Legs largely red; middle tibia partly infusate or brown; hind tibia and tarsi II and III dark brown; sometimes also tarsus I and coxa I infusate. Tibial spurs of middle and hind legs white.



Figs. 4—6. *Strabotes rupelae* n.s.: 4, male paratype; 5, ♀, pronotum; 6, ♀, temple.
 Figs. 7—8. *Strabotes abdominalis obscurus* n.ssp. ♀, pronotum and temple (paratype).

Front wing hyalinous with broad brown band in first brachial and basal part of discocubital cell and darkened from beyond areolet until apex.

Abdomen black or red, or rarely black with some red parts; from second tergite onward mat with dense short hairs. Hind rim of tergite 7 nearly always whitish.

Male (fig. 4):

Length ranging from about 7.5—12 mm; front wing 5.3—8.5 m. One extremely small specimen with an anomalous thorax is only 4.5 mm long.

Essentially like the female; differs by shape of abdomen and as follows: Facial orbit nearly always broadly white (in two specimens that have much reduced white on frontal orbit, face completely black). Frontal and temporal orbits always marked with white. Clypeus rarely white or whitish, usually red. Flagellum without an annulus; with 24—28 segments (23 in extremely small specimen); the mean number of segments as counted in 57 antennae of 30 specimens was 27.0 (2 x 24; 4 x 25, 5 x 26, 27 x 27, and 19 x 28 segments).

White on collar usually reaching a little further downward than in female; rarely beyond level of epomia. Upper margin of pronotum nearly always with a white stripe that sometimes extends beyond notaulus. Always white on subtegular ridge, upper part of metapleurum and scutellum, and on mesoscutum as far as could be checked (sometimes the pin does not enable this). Postscutellum white or with some whitish marking in about half of the specimens. Tegula nearly always with a white mark on its frontal half, sometimes completely white; in one male completely black. Propodeal crests always, and usually the area surrounding them, white.

Legs largely red with most of the tibiae and tarsi blackish. Coxae ranging from red to black; coxa and trochanters of front leg sometimes marked with white.

Front wing with only the apical part beyond areolet brown.

Basic colour of abdomen red or black; if red, the first 3 \pm tergites often extensively marked with black. Tergites 1 and 2 always, 3 often with an apical white band. At least tergite 3 with white in the apical corners; apical corners of tergite 4 often, and those of tergite 5 sometimes marked with white (see table I). Tergite 7 always broadly white at apex.

H o l o t y p e: ♀, Surinam, nr. Paramaribo, reared from *Rupela albinella*, cocoon collected in rice on CELOS-Res. Station, emerged 23 X 1968, K. W. R. ZWART (ZWART).

P a r a t y p e s (92 ♂, 129 ♀): All from Surinam. 77 ♂, 109 ♀, reared from *Rupela albinella* at CELOS-Res. Station near Paramaribo. Most of these by P. J. HUMMELEN during March 1971 to May 1972; others by K. W. R. ZWART during Oct. 1968 to Jan. 1969. (Paratypes of these will be deposited in collections ZWART, Wageningen, TOWNES and in some larger musea.) — Other data are: 1 ♂, 3 ♀, reared from *Rupela albinella*, Wageningen-Rice-Scheme, Wageningen-Surinam, XI 1954, J. v. DINTHER, (Wageningen). 3 ♂, 1 ♀, same data except for emerged 16 IV, 22 IV, 20 V and May 1959. (Wageningen). 2 ♀, Paramaribo, 25 I 1960, P. H. VAN DOESBURG (ZWART). 1 ♂, nr. Paramaribo, CELOS-Res. Sta. 3 II 1968, K. W. R. ZWART (ZWART). (N.B. Rice was not yet grown at the Station at that

time). 1 ♀, nr. Paramaribo, against window in CELOS-building, 15 VII 1968, K. W. R. ZWART (ZWART). 2 ♂, 10 ♀, nr. Paramaribo, CELOS-Res. Sta., most along rivulet, 20 VII; 26 VIII; 9 IX; 4 X; 2, 6, 23, 25 XI; 3, 4, 13 XII 1968 and 18 I 1969, K. W. R. ZWART (ZWART). 8 ♂, 3 ♀, same data but collected in rice field on 16, 22, 25 X; 22 XI and 13 XII 1968 (ZWART).

Host:

The holotype and most of the paratypes were reared from *Rupela albinella*. I found it to be an ectoparasite of the last instar larva, and HUMMELEN (1974) reports it as feeding sometimes also upon the pupa. He even noticed it once feeding upon a larva of *Venturia ovivenans*. There is such an important variation in sizes that I presume that younger host larvae will sometimes be attacked.

General remarks:

I did not find any correlation between size and colour pattern. Nor is there any correlation between the rate of development of yellow markings on head and thorax, and the colour of the abdomen.

Of a sample of 40 females, 27 have more or less developed white frontal orbits, and 5 have some trace of it. All of these have some white on the outer orbit. Of 8 specimens not showing white on the frontal orbit, 5 have some white on the outer orbit, and 3 do not show this.

Little more than half of all females have the abdomen red, and there are only very few intermediates. Specimens with a red or black abdomen were reared throughout the year, so that there is no evidence that they are seasonal colour forms induced by climatic factors. It must be stated, however, that rice growing was artificially made possible during the whole year, while naturally this is only possible in restricted periods. — Pupae may already show a black abdomen.

Also the male does not show any correlation of colour forms and season. Specimens with a black abdomen, however, are more numerous than those with a more or less red abdomen. Out of 75 males, 19 were judged to be "red", and 43 were black; the others being intermediate in this character. The red males show less white colouration on the abdomen than the black ones do, as is shown in table I.

TABLE I

	abdomen	
	red (n = 19)	black (n = 43)
tergite 3 with white apical band	7 (= 37%)	36 (= 84%)
tergite 4 with white apical corners	5 (= 26%)	23 (= 53%)
tergite 5 with white apical corners	1 (= 5%)	8 (= 19%)

Table I: Colour pattern of abdomen in 62 males of *Strabotes rupelae* n.s. — N.B. All specimens have at least the apical corners of tergite 3 marked with white.

3.2. *Strabotes abdominalis abdominalis* (Cresson)

Ischnocerus (!) *abdominalis*; CRESSON, 1865; Proc. Ent. Soc. Philadelphia 4: 25. ♀
Strabotes abdominalis; TOWNES, 1970; Mem. Amer. Ent. Inst. 12: 281.

In the TOWNES collection, there is a male and a female from Cuba which were compared with the type by Dr. ALAYO from Havanna. The female fits the description very well. However, CRESSON did not mention the clear white markings on the upper part of metapleurum and the area surrounding the small propodeal tubercles. Moreover CRESSON states "tibial spurs whitish", while the spurs of front legs are clearly red like in all other *Strabotes* I have seen. The front wing is faintly dusky and only slightly darker at the apex. The lack of darkened bases of tergites 2 and 3 in the specimen studied may be considered of no importance.

Structural differences with *S. rupelae* are mentioned in the description of *S. abdominalis obscurus*.

As the male of *S. abdominalis abdominalis* has not been reported in the literature, some additional characters of the only specimen known to me are given.

Male (nov.):

Similar to male of *S. abdominalis obscurus*; different from this by characters mentioned in the key and further by the clearly red abdomen having only white apical bands on tergites 1 and 2. Particularly the lack of white on tergite 7 is striking as all other *Strabotes* males I studied have this tergite broadly white apically. Flagellum with 27 segments. Front wing faintly dusky.

Material studied: 1 ♂, Cuba, Lag. Ariguanabo, Prov. Habana, III-14-1961, I. Gaicia. 1 ♀, same locality, XII 1961 (TOWNES).

3.3. *Strabotes abdominalis obscurus* nov. subspec. (figs. 7—8)

Strabotes abdominalis partim.; TOWNES 1970; Mem. Amer. Ent. Inst. 12: fig. 240 on p. 481.

Seven Columbian specimens from the TOWNES collection are structurally similar to *S. abdominalis* from Cuba but have less white on head and thorax in the female. Concerning their colour pattern they do not differ very much from *S. rupelae*.

This subspecies, like *S. abdominalis abdominalis*, differs structurally from *S. rupelae* by: Punctures on temple very shallow, separated in the centre by several times their diameter (fig. 8); microsculpture on temple less developed. Pronotum laterally with a large smooth area at its frontside; upper margin of pronotum with clearly separated punctures. Below upper margin clearly striated (fig. 7). Scutellum smooth, almost without punctation. Propodeal apophyses only present as very low blunt tubercles.

Female:

Flagellum with 23—24 segments, with a white annulus on segments 5 (partly) and/or 6—9. White on frontal orbit reaching level of antennal socket, sometimes faintly extending on facial orbit. Upper margin of pronotum ranging from completely black to clearly white. Subtegular ridge and upper part of metapleurum reddish or black. No white markings on mesoscutum. Scutellum white or brownish with the sides white. Propodeal tubercles white to black. Front wing rather uniform-

ly dusky, the tip very slightly darker. Abdomen black in one female, red in three others (including type).

Male:

Flagellum with 26—27 segments.

White: total orbits very broadly, except for a short interruption near clypeus, labrum, clypeus, face partly, upper $2/3 \pm$ of anterior margin of pronotum, upper margin of pronotum to beyond notaulus, two lines on mesoscutum close to notauli, subtegular ridge, tegula, scutellum, postscutellum, upper part of metapleurum and propodeal tubercles with the area surrounding them. Basic colour of abdomen black or reddish; apical white bands on tergite 1 and 2 and tergites 3—6 with very narrow white apical bands that are not broadened towards the sides as in *S. rupelae*. Tergite 7 broadly white apically.

H o l o t y p e: ♀, Columbia, Palmira, August 1943, B. LOSADA S. (TOWNES). This is the specimen upon which TOWNES (1970, fig. 240) based his generic drawing. The left wings are apparently removed.

P a r a t y p e s: Same locality and collector: 2 ♀, July 1943; 1 ♀, February 1944 (with black abdomen); 1 ♂, July 1943; 1 ♂ August 1943; 1 ♂, January 1944. (TOWNES) All females with red abdomen are damaged in some way; whether the left wings, antennae or ovipositor are lacking.

I am very much indebted to Dr. HENRY and Dr. MARJORIE TOWNES (Ann Arbor/U.S.A.) for their great hospitality when studying their collection and for the loan of material. Prof. J. D. LATTIN made improvements to most of the English text of this paper.

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Fourth International Congress of Acarology. Dit congres zal van 12—19 augustus 1974 te Saalfelden in Oostenrijk gehouden worden. Gedurende vier dagen zal in 12 secties vergaderd worden, terwijl verder diverse symposia georganiseerd zullen worden.

Gedetailleerde informatie kan verkregen worden bij het secretariaat van het congres, Zoologisch Instituut der Universität Wien, Wien I, Dr. Karl Luegerring 1, Oostenrijk.