THE LATERALIS GROUP OF THE BOMBYLID GENUS VILLA.

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The following notes are given in an attempt to make available a key and descriptions to a part of the "clear winged" species of the genus *Villa*. Together with the *Alternata group* and perhaps a few others, these species may be considered to constitute the entire genus as defined by Bezzi and the remaining American species of the old genus *Anthrax* would be distributed among several other genera. If his lead in this matter is followed at least two new genera will have to be made to receive some of these species, but the whole matter should receive attention only when the greater majority of the species of the old genus *Anthrax* and a considerable number of new specimens are available for study. The clear-winged species were named the subgenus *Hyalanthrax* by Osten Sacken (7), and may be distinguished as having:

1. Front tibia with or without spines.
2. Face very little projecting, convex.
3. Third antennal joint short-conical, merging gradually into the style.
4. Wings hyaline or with only C, Sc, 1st M, and R and the veins inclosing them darker.

Most of the species may be divided as follows:

1. Front tibia without spines, or if minute bristles are present, the abdomen is two or more times as long as wide (slender).....*lateralis sub-group*
2. Front tibia with spines or if these are lacking the abdomen is less than two times as long as wide (robust).....*alternata sub-group*

In *V. lateralis* var. *nigra* Cress, there are a few minute bristles on the front tibia and in *V. molitor* Lw. the number of spines present is variable; possibly they may be absent in a few specimens. Outside of these two cases and one mentioned by Cresson (5, p. 444) the presence or absence of these spines appears to be a usable character and the only structural one in the group.

All types unless otherwise stated are in my own collection.

LATERALIS SUB-GROUP.

In addition to the ones given in the key the following probably also belong here: *gemella* Coq., *hircina* Coq., *nebulo* Coq., *squamigera* Coq., and *telluris* Coq. *Turbata* Coq. and several of Cole's species are quite similar to this group of species, but are distinguished by having the mesonotum yellowish tomentose. No attempt has been made for an exhaustive study, but the material which was available has been described.

KEY TO THE SPECIES.

1. Cell R and the base of R1 brownish....2
   Wings hyaline except sometimes costa and subcosta....4
2. Tomentum of face blackish or brown....*shawii* (Johns.)
   Tomentum of face light yellow or white....3
3. Dorsum of abdomen without black tomentum....compressus n. sp.
   Dorsum of abdomen with black tomentum....*faunus* (Fab.)
4. A median longitudinal stripe of yellow tomentum on mesonotum *muscaria* (Coq.)
   This stripe not present....5
5. A tuft of black scales on the sides of segment three....6
   Black scales on the sides of segment three and four generally absent or reduced to a few scattered ones....salebrosus n. sp.
6. Scales on sides of segment three brown to white; many brown scales intermixed with the usual black tomentum of abdomen and thorax; venter nearly all pale tomentose....*mucorea* (Loew)
   Scales on sides of segment three black; tomentum not mixed; venter with bands of dark tomentum....7
7. Deep, reddish-brown tomentose bands on segments 5 and 6...*concessor* (Coq.)
   Tomentose bands on 5 and 6 the same color as the light colored tomentum on the remainder of abdomen or black....8
8. Scales on widened base of costa mostly yellow....*flavocostalis* n. sp.
   Scales on widened base of costa all or mostly black....*lateralis* (Say)

Villa lateralis (Say).

The 177 specimens of this species and its varieties that I have examined come mainly from Texas and New Jersey, but also there are specimens from Ohio, Tennessee, California, Georgia, Ontario, Arizona, Kansas, Massachusetts, Colorado, and Iowa, Guatemala, British Columbia, Washington, and New York. For the typical specimens I have accepted Cresson's diagnosis of this species and followed his description (5; p. 440).

In addition to the genitalia the sexes may be distinguished as follows: (1) In the female a patch of long curly white or yellowish scales is present on the sternopleuræ and overlaid by long thin hairs. In the male these latter are present but the scales are lacking. (2) The width of the front in the female is nearly twice that of the male. (3) In the female on either side of segment 7 of the abdomen there are small patches of silvery scales (in one or two very dark yellow or orange colored specimens these are yellowish). In the center the scales are black, often with some yellow scales at the base. In the male the number of silvery

scales varies from a condition in all respects like the female (*sabina* O. S.?) to one in which all the scales on segment 7 are silvery. This character does not seem to be linked with the geographic distribution, for I have extremes of the series from both N. J. and Texas.

The ground color is generally black; often with the outer sides of segments 2 and 3 of the abdomen reddish. A specimen from Tennessee has most of the abdomen dark brown; otherwise it is a typical *lateralis*. The color of the lighter pile and tomentum varies from almost an orange to nearly white. There is considerable variation in the color of the scales on the venter of the abdomen and also in the amount of yellow scales on segments 3, 5, and 6; but these variations cannot be well enough characterized to give them a varietal name. The color of the knob of the halteres varies from white to dark brown without correlation with other characters. The costal and sub-costal cells vary from hyaline to dark brown. The scales on the mesonotum are brassy sometimes.

In view of the observations given above, *sabina* O. S. may be distinguished from *lateralis* only in having segment 7 with "a tuft of snow white hair on each side" (if it is hair). Osten Sacken had only a single specimen of *lateralis* from Eastern U. S. for comparison when he drew up the description of *sabina*. It seems that they are synonyms.

The Texas specimens were taken on *Tetraneuris linerais*, *Dicrophyllum marginatum* and *sumac* principally, and I have them from central and southern parts of the state. Possibly it is the commonest Bombyliid there and is found from March until November.

Varieties of V. lateralis (Say).

Coquillet, Johnson and Cresson from time to time have distinguished several varieties of this species and given them names. As indicated below some of these intergrade into the typical species, while others, according to our present collections, do not. Although it is often possible to distinguish only the more extremes of these intergrading forms, yet the naming of the varieties simplifies the placing of specimens in this variable species. I have not seen the variety called *gracilis* by Johnson (Canad. Ent., 15, p. 14), but the form is not the same as the one so-called by Coquillett, whose determination I have followed. I would therefore give this variety the new name *johnsoni*, retaining *gracilis* for the species described by Coquillett, which species belongs in the *alternata* group. Some varieties occur throughout the range of the species; others are more local, according to my material.

KEY TO *Lateralis* AND VARIETIES.

1. Bands of light colored tomentum on abdomen wide; a yellow tomentose triangle in front of scutellum.....4
   Bands of light colored tomentum on abdomen narrow or lacking; dorsum of thorax black tomentose.....2
2. Pile of pleura black.....*nigra* Cress.
   Pile of pleuræ white or yellow.....3
3. Tomentum of face yellow.....*ater* n. var.
   Tomentum of face black and shining.....*johnsoni* n. nom.
4. All legs or at least femora reddish yellow in ground color.....*fulvipes* Coq.
   Legs black.....5
5. Light colored tomentum of dorsum all of about the same shade, whitish yellow to golden; legs black.....*lateralis* Say
   Light colored tomentum not all of about the same shade.....6
6. Light colored tomentum white except on abdominal segment 7 and on prescutellar triangle.....*arenicola* John.
   Light colored tomentum white, or lighter only on 2nd segment of abdomen; a very broad band of silvery scales in the male on abdominal segment 7.....
   faustina O. S.

Var. *faustina* (O. S.).

This variety was named as a distinct species by Osten Sacken, who, however had, at that time, only a single typical specimen of *lateralis* for comparison.

The males may be distinguished by the very broad band of silvery scales on segment 7, which point inwardly from each lateral border and meet in an indistinct line down the center of the segment; second segment with a crossband of white scales thus lighter in color than the bands on the other segments. The border of golden tomentum on the posterior margin of the scutellum is replaced by black scales entirely in most specimens or reduced in others; color of entire lighter body pile and tomentum whitish yellow. The females are practically indistinguishable from the typical *lateralis*. The femora in both sexes are sometimes lighter in color, in this respect resembling var. *fulvipes*, and from which they probably cannot be separated. Originally described from Mexico. There are 8 males from San Gabriel Mts., Cal., June and July; 2 males from Clear Creek and Chimney Gulch, Col., in the Ohio State University collection. Two females taken with the California males are probably the other sex of this form; they differ from *lateralis* only in having the crossband on 2nd segment slightly lighter. All specimens in the Ohio State University collection. I have also seen a female in the collection of R. C. Shannon from Ritzville, Wyoming, taken in August.

Var. *fulvipes* (Coq.)

Differs from the typical *lateralis* only in having the femora and often all the legs wholly reddish yellow in ground color instead of black. The lighter colored pile tends to be rather whitish. One male and one female, San Angelo, Texas, Sept.; 1 female, Brownwood, Tex., Sept., and in collection of R. C. Shannon, 1 female, Coules City, Wyo. In the O. S. U. collection 1 female, Ira, Ohio, 1 female, Gualan, Guatemala, and 1 female, Clementon, N. J.

Another female, Austin, (April), in my collection, has all yellow legs but is suggestive of *faustina* on account of the white tomentum on segments 2 and 4.

I have a male and 2 females from Austin (April) and Brownwood (June) in which only the bases of the femora are lighter in color. These must be considered to be intermediate between this variety and the typical *lateralis*.

Var. *nigra* Cresson.

"Tomentum of abdominal dorsum, venter and patch on pleura entirely black or with narrow basal band on segment 4. Lateral scales of segments 3–6 entirely black or a few white on 4. The usual silvery scales on 7 present." (Cresson, Ent. News, 27, p. 442.)

The tomentum of the face is grayish to shining. The variety may be distinguished from Var. *johnsoni* [n. nom for *gracilis* Johns. (nec Macq.) (6).] by the color of the hair on the pleura. Six specimens, Ontario, Onaga, Kan., Framingham, Mass., Cincinnati, O., all males and all except the Framingham specimens in the O. S. U. collection; also 2 males in R. C. Shannon collection from Ann Arbor, Mich., and Tarrytown, N. Y. The specimens may be arranged in a series with regard to the amount of light colored pile on the venter; ranging from only a few white scales on the first two segments to one with a good many on each. The specimen from the last named locality, which has the most light colored tomentum on the venter also has a few whitish scales on the dorsum of segments 2, 3, and the sides of 4; the rest of the dorsum with black scales, thus showing a tendency toward the typical form.

In my collection there are four males from Riverton, N. J., and there is a male from Ames, Iowa, in the collection of Mr. Hull which have the tomentum of the face black with a grayish reflection in some lights. The hair is black on the pleura. These might be considered a separate variety but I doubt the necessity of separating them from *nigra*. All the specimens of *nigra* which I have seen have 3 or 4 very minute bristles on the front tibia, which are about half the size of those generally found on the *alternata* group.

Var. *ater* n. var.

All tomentum of the dorsum of the thorax metallic, black and shining; edge of the scutellum with a few yellow scales; tomentum of face yellowish; pleuræ yellow haired, whitish in the female. Otherwise as in *lateralis*. Length 10 mm.

Type: Male, Riverton, N. J., July 28, 1920.

Allotype female, Austin, Texas, Sept. 11, 1922.

Paratypes: 1 male, Riverton, N. J., in my collection and 2 males, Akron, and Ira, Ohio, in the O. S. U. collection.

This variety has the yellow tomentose triangle of the front of the scutellum of the typical *lateralis* replaced by black scales. It is closely related to *nigra* and *johnsoni* and has the tomentose bands on the abdomen rather narrow. The venter has most of the segments with white scales.

Var. *arenicola* Johnson.

I have seen 15 specimens of both sexes form Coules City and Stratford, Wyom., in the collection of R. C. Shannon. The variety is well described by Johnson thus: "6 to 7 mm. in length, with white tomentum and pile. The only yellow tomentum is a small triangular patch in front of the scutellum and sometimes scattered scales on the terminal segment of the abdomen. The second, third and fourth segments have prominent basal bands of white tomentum. This form seems to be more numerous in the spring."(6).

Villa flavocostalis n. sp.

Tomentum of the widened base of the costa orange yellow; black scales along the anterior margin of the costa. All light colored tomentose bands of the abdomen very wide; 4, 5, and 6 with only a few rows of black scales, 2 and 3 with more black scales. Remainder of the structure and distribution of the pile and tomentum as in *lateralis*. Length 13 mm.

Type: female San Angelo, Texas, Sept. 13, 1921.

Paratypes: 2 females, Brownwood, Texas, June 17, 1921, and Sept. 22, 1925.

This may be only another variety of *lateralis* but it will require more specimens, especially males, to tell for certain. The appearance is quite distinctive.

Villa concessor (Coq.).

A female from Miner's Peak, Utah, in D. G. Hall's collection and a male in my own collection from Brownwood, Texas, Sept. 22, 1925, and a male in the Ohio Collection from Los Angeles Co., Cal. Cresson considered this a variety of *lateralis* but the deep reddish brown tomentose bands on the 5th and 6th segments are quite striking. I have never seen this condition approached among the typical *lateralis* specimens which never get darker than a golden yellow and this equally on all segments. The sparse pile on the thoracic dorsum is twice as long as it is in *lateralis* in relation to the size of the specimens, and the appressed blackish tomentum of the thorax has a much more metallic luster.

Villa mucorea Loew.

In general appearance much like *lateralis* but somewhat stouter. The chief differences are: Black tomentum much interspersed with brown, seeming to alternate in indefinite longitudinal stripes on the mesonotum. The usual yellowish tomentose triangle in front of the scutellum mixed black and brown tomentose with whitish tomentum on all margins of the scutellum. All pile white, short and erect on dorsum of thorax. Brown to white scales on the sides of segment 3 (where they are black in *lateralis*). Abdominal pattern much like *lateralis* but the tomentum is brown in *mucorea* where it is black in the former.

Loew had a single female from Nebraska, and I have seen in R. C. Shannon's collection 2 males from Stratford, Wyom., Sept. 4th, and Ritzville, Wyom., Sept. 9th. Taking into consideration the difference in sex they agree very well with Loew's description.

Villa salebrosus n. sp.

Female: Ground color black; pile and tomentum of face, and tomentum of front silvery; pile of front black; pile and tomentum of first joint of antennae silvery below, black above. Thorax marked as in typical *lateralis*. Sides of the abdomen at the base with a long yellow bushy pile which emerges into long scales on the sides of the 3d segment. The scales are black on the sides of segments 5 and 6 and yellow on 7. There are two or three black scales on the sides of segment 3. The black tomentose crossbands on the dorsum of segments 1 to 4 do not reach the sides but are half lens shaped. A fringe of black scales on the apex of segments 5, 6 and 7. Venter white tomentose, a narrow band of black tomentum on the bases of segments 3, 5, 6, and 7, and a spot in the center of the base of segment 4. Legs black, black tomentose. Femora with white tomentum at the base. Length 12 mm.

Type: Female San Angelo, Texas, Sept. 13, 1921.

Paratypes: Two females, Brownwood, Texas, Sept. 16, 1920.

The erect yellow pile on the sides of the abdomen gives this species an appearance different from typical *lateralis* or *flavocostalis*.

Villa muscaria Coq.

There are 2 females and 1 male specimens in the collection of O. S. U. from Montclair and Berkeley, Col., in August and September. The principal characters of the species are: the median longitudinal yellow tomentose stripe across the center of the thorax, the black tomentum at the apex of segments 5 and 6, and the legs chiefly yellow. This species and species *salebrosus* differ from the others in having the black scales of abdominal segment 3 largely replaced by yellow ones; the thoracic stripe is not prominent in the male.

Villa faunus Fab.

There are three specimens from Onaga, Kan., and one from Spring Creek, Ga., which are thus labeled in the O. S. U. collection and evidently are similar to the specimens which Coquillett had. There is a female of this species in the collection of H. J. Reinhard, taken at Moore, Tex., June 7. So far as I can tell they differ from *lateralis* only in having expanded costa with a patch of yellow scales among the black; and in having cells C, Sc, 1st M, R, and the base of R5 and R1 quite brownish.

Villa compressus n. sp.

Male: Ground color, dull black. Genitalia and 1st joint of antennæ yellowish red. Face and front yellowish tomentose and black pilose, a patch of large white scales between the antennæ and on the lower part of the front. First two joints of the antennæ black haired. Occiput white tomentose and yellowish pilose. Thorax yellow pilose, on sides and in front short black, scattered pilose on dorsum. A patch of white pile below the root of the wing and extending to the front of the thorax. The tomentum of the mesonotum consists of narrow yellow scales with a V-shaped stripe of white ones about one-quarter of the way from the

front of the thorax. Longer white tomentum above the roots of the wings and at the base of the scutellum form with this stripe an irregular circle on the dorsum of the thorax. Remainder of the scutellum yellow tomentose. Spines of scutellum and thorax yellow. Abdominal tomentum of narrow scales mostly yellow; wide white stripes of tomentum on the bases of segments 3, 5, 6 and 7. Pile white on the sides as far down as the middle of the 3d segment, beyond that they merge into long narrow yellow scales intermixed with stiff black hairs. Similar hairs on the apex of each segment and on the coxæ. A tuft of white pile behind the wings and halteres. Length 7 mm. Wings hyaline except cells C, Sc, R, and a trace of a cloud on the bases of Cu 1 and R 5.

Type: Male, Brownwood, Texas, Sept. 16, 1920, in my own collection.

This specimen runs to *inculta* in Coquillett's key (Trans. Am. Ent. Soc. XIX, July, 1892), but differs in the coloration of the antennæ and vesture of the face and abdomen.

This species differs from the remaining species dealt with in this paper in a way which is difficult to characterize. The smaller size, shorter but broader abdomen and the tomentum which consists of very narrow scales, seem to be the more important differences. The following species, which I have seen in the National Museum, and perhaps some others are quite similar; *inculta*, Coq.; *crocina*, Coq.; *tantilla*, Coq.; *variata*, Coq.; *cinefacta*, Coq.; *terrena*, Coq.; *gemella*, Coq.; *hiercina*, Coq.; *torbata*, Coq.; *anna*, Coq.; *comparata*, Tucker; and *alta*, Tucker. Possibly they constitute at least a separate group but lack of material has prevented my further study of them.

Villa shawii Johnson.

There are 3 females and 1 male from Clementon and Iona, N. J., in the O. S. U. collection. This species is easily distinguished by the dark orange pile, dark tomentum of the face, and the brown anterior border of the wing. Cell R and R1 are also dusky in these specimens.

BIBLIOGRAPHY.

1. Bezzi, M.
The Bombyliidæ of the Ethiopian Region.
2. Cole, F. R.
Proceedings of the California Academy of Sciences-Series 4, Vol. XII, No. 13, pp. 289–314.
3. Coquillett, D. W.
Trans. Amer. Ent. Soc. XIV, p. 159.
4. Coquillett, D. W.
Trans. Amer. Ent. Soc. XIX, p. 168.
5. Cresson, E. T., Jr.
Ent. News, Vol. 27, p. 439.
6. Johnson, C. W.
Psyche, Vol. 15, p. 14.
7. Osten Sacken.
Biologia Centralia Americana, Diptera, p. 134.