

brood, the new pupa shell with its great clypeal spur seems scarcely to get thoroughly hardened before the imago is ready to burst forth.

For an examination of tubercles and the specially developed protective plates, *Achatodes zeæ* furnishes a good delineation. A record of the species from the middle West, stating the pupa was formed within the burrows, when boring *Sambucus*, is quite the reverse of what occurs in this locality where the pupa is always formed in the ground.

After passing the representative borers there are still others that burrow or mine in their various food substances. Some, like *Scopelosoma*, only do so in their earliest stages.

Whatever attraction boring larvæ may have for the collector or student, one point worth remembering is the prevalent localization that necessarily exists with many of the species, so that unfamiliar territory will quite often disclose an unexpected guest, perchance some coveted rarity.

DESCRIPTIONS OF NEW MALLOPHAGA FROM NEBRASKA.

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(PLATES XX-XXII.)

For a number of years the writer has been greatly interested in the study of ornithology, and having in the meantime begun the study of entomology, he naturally became interested in the insect parasites of birds, namely, the group known as Mallophaga. In addition to the writer's own collection he has had access to that of the University of Nebraska and also to the private collections of Professor Lawrence Bruner and J. C. Crawford, Jr. I wish to express my thanks to the owners of these collections for their use and especially to Professor Vernon L. Kellogg, of Leland Stanford University, Cal., for his kindness in looking over the manuscript and drawings before publication, and for his helpful suggestions, most of which have been followed out. The types and co-types from which these forms were described are located as follows: In the University of Nebraska collection are types of *Nirmus trimarginis*, *Nirmus biocellatus* var. *nigropictus*, *Nirmus angustifrons*, *Colpocephalum quadrimaculatus*, *Nitzschia pulicaris* var.

tibialis, co-type *Akidoproctus kelloggi*. In the collection of J. C. Crawford, Jr., are the types of *Nirmus truncatus* var. *magnocephalus* and *Akidoproctus kelloggi*. In the collection of Professor V. L. Kellogg are co-types of *Akidoproctus kelloggi*, *Nitzschia pulicaris* var. *tibialis* and *Nirmus angustifrons*. In my own collection are types of *Docophorus cephalosus*, *Nirmus infrequens*, *Physostomum picturatus*, co-types of *Nirmus truncatus* var. *magnocephalus*, *Nirmus trimarginis*, *Nirmus biocellatus* var. *nigropictus*, *Nirmus angustifrons*, *Akidoproctus kelloggi*, *Nitzschia pulicaris* var. *tibialis*.

***Docophorus cephalosus*, sp. nov.**

Female.—Body, length 1.55 mm., width .68 mm., deep smoky brown throughout with darker markings, body short, head large, wider than the abdomen, and tapering sharply to the narrow, truncate clypeus; abdomen nearly obscured by the deep chestnut lateral blotches.

Head, length .57 mm., width .72 mm.; wider than the abdomen, tapering sharply from the rounded temples to the comparatively narrow clypeus; front truncate, slightly concave; tip of clypeus colorless, with two short marginal and two dorsal hairs at the lateral angles; one short hair near the clypeal suture and two behind it; trabeculae large, slightly curving and bluntly pointed; antennae* short and stout, first two joints longest, remainder short and subequal; eyes prominent, obscured with brownish, with a short hair; a notch at the posterior angle of the eye; temples broad and rounded with two rather short pustulated hairs; occipital margin deeply concave; antennal bands heavy to the suture, where they are broken, then continuing to the clear portion of clypeus as narrow marginal bands; the posterior portions bend inward at the trabeculae and meet over the mandibles; a short ocular band from base of antennae to eye; temples narrowly margined with blackish-brown, shading inward; occipital bands slightly darker than ground color, running to base of the mandibles, where a curving branch is sent off to join the ocular blotch just before the eye; a transverse clear band just behind the heavy curving antennal bands.

Prothorax short, almost hexagonal, with a short hair at the posterior angles; heavy blackish-brown lateral bands; median portion slightly clearer than ground color of head. Metathorax about as long as prothorax; sides slightly concave, broadly diverging; posterior angles with two rather short hairs, posterior margin angulated on the abdomen, with a row of about nine pustulated hairs on each side; whole segment deep blackish-brown.

Abdomen short, nearly as wide as long, widest at third and fourth segments, thence tapering sharply to the tip; posterior angles protruding, with one hair in segments 1, 2, 4, and 9, the remainder with two; segments 1-7, with large deep smoky-brown lateral bands, completely covering the first segment and separated medially on the remainder by a narrow clear space; the posterior margins of the lateral bands with from six to nine short hairs arising from large clear pustules, eighth segment with a median lighter portion; ninth segment very small and rounded.

* On account of the haste in the preparation of drawings the antennae were omitted.

Legs short and stout, concolorous with head, with slight annulations at the tip of the femora and tibiae.

The male differs from the female by being longer, the head narrower, the abdomen narrower, with sides subparallel and tip broadly rounded; the first segment of the abdomen is wider than the rest with sharply projecting posterior angles, the metathorax with a median clear portion, abdomen being completely obscured by the continuous lateral bands which on the first and second segments are pustulated as in the female but the remainder have not more than four small pustules, the suture between the eighth and ninth is clear, while the tip of the ninth is dusky with numerous small pustules; the genital hooks are very long, though not exceedingly heavy, extending from posterior portion of third segment to tip of abdomen.

It measures: body, length 1.67 mm., width .52 mm., head, length .56 mm., width .64 mm.

Several males and females collected from a Red-shafted Flicker (*Colaptes cafer*) shot at Lincoln, Neb., Nov. 3, 1900. This new form has little resemblance to any species of this genus yet described from any of the *Pici*. It is easily recognized by the short body and wide, abruptly tapering head.

***Nirmus truncatus* var. *magnocephalus*, var. nov. (Pl. XX, Fig. 4.)**

Female.—Length 1.7 mm., width .34 mm.; deep fuscous throughout, with darker margins on head, thorax and abdomen; head conical in front, broadly and squarely truncate; metathorax long and nearly parallel sided; abdomen subclavate.

Head, length .46 mm., width .31 mm.; front conical, broadly truncate, with sides straight and lateral angles of clypeus rounded and having five short dorsal hairs; two short dorsal hairs in front of the trabeculae; ocular emargination deep; trabeculae pale, pointed and equal to the first segment of the antennae; antennae slender, the second segment the longest, equal to the third and fourth combined, last three subequal and darker than the first two; eye prominent, convex, colorless, with a strong hair; temples flattened, narrowing posteriorly, with two long hairs; occipital margin slightly concave, narrowly margined with dark brown; a clear transverse band along the clypeal suture; antennal bands narrow, scarcely darker than the ground color of the head; a blackish blotch at the base of the trabeculae; a larger and darker ocular blotch; temples narrowly margined with blackish, while the whole temple is a deep fuscous from the margin inward to the occipital bands, which are narrow, brownish, and terminate at the ocular blotch; mandibles chestnut; a lanceolate, fuscous occipital signature.

Prothorax quadrilateral; anterior angles and sides rounded; posterior angles with a long pustulated hair; anterior angles and lateral margins deeply bordered with brownish, which extends for a short distance around on the posterior margin; the coxal lines showing through plainly. Metathorax longer than prothorax, with a median, lateral emargination, and but slightly diverging sides; posterior margin transverse, with four or five long hairs having large pustules; lateral and posterior sides heavily margined with deep brown, almost a chestnut, while the whole segment is darker than the rest of the body.

Legs long, the two posterior pairs very stout, especially the femora.

The abdomen distinctly clavate, widest at the fifth and sixth segments, and bluntly rounded by the last three; posterior angles projecting, with one long hair, except the last three segments which have two; segments one to seven narrowly margined with blackish-brown, shading inward, and extending into the adjacent anterior segment; the spiracles showing as prominent clear spots just within the dark lateral bands; the interior portion heavily obscured by dark brown transverse bands, slightly clearer at the sutures and partially divided medially by a pale longitudinal line except on the eighth and ninth segments; ninth segment flatly convex and uniformly brown; a transverse row of about seven short, slightly pustulated hairs in the median portion of each segment except the last.

Four females collected from a Wilson's snipe (*Gallinago delicata*) (Ord.) by J. C. Crawford, Jr., Lincoln, Neb. and one female from a skin of Franklin's Gull (*Larus franklini*), which may have been a straggler. My specimens differ considerably in many details from Piaget's description and figure. The total length is about the same but the head is markedly larger, while the metathorax is nearly parallel sided instead of diverging, and on the whole if not deserving specific rank it is at least a well-marked variety.

Nirmus biocellatus, var. **nigropictus**, var. nov. (Pl. XXI, Fig. 1.)

Female.—Length 2.15 mm., width .6 mm.; pale, with bold blackish-brown markings on head, thorax and abdomen; the antennal bands together with the internal bands forming a clear parallelogram on each side of the head.

Head, length .51 mm., width .55 mm.; broadly parabolic in front and naked; temples parallel with one weak hair and two short bristles; occiput slightly concave. Antennal bands heavy, running forward to the margin of the narrow, clear oral groove, the posterior ends bending in at trabeculæ and meeting the broad brown occipital bands; narrower internal bands run forward from the bend of the antennal band, parallel to the sides of the head, to the margin of the oral groove then parallel to it to the end of the head, where they again join the antennal bands, forming a clear parallelogram on each side of the longitudinal oral groove; temples narrowly edged with blackish; a short ocular band joining templar and antennal bands; a brown, oval, occipital signature; trabeculæ short and uncolored; antennæ with first segment clear, the remainder broadly annulated with blackish.

Prothorax very short, margined laterally with blackish; a hair at the posterior angles. Metathorax short but broader than first segment of the abdomen; sides very broadly diverging; posterior margin angulated, with six weak hairs on each side; anterior angles with a dark blotch and posterior margin with a broad black band. Legs short, rather stout, femora and tibiæ broadly margined anteriorly with black.

Abdomen elongate oval, abruptly pointed posteriorly; posterior angles protruding, with one weak hair; segments with lateral blackish blotches extending inward one third the width of the abdomen, separated by broad clear sutures and narrowing and lightening inwardly; lateral blotches with two large, round, median clear spots, and connected on segments 1-5 by broad, brown transverse bands; a large brown median spot on segments six and seven, narrowing posteriorly; ninth segment with a small

brown blotch on each side; a transverse row of short hairs along the middle of the segments, not reaching the lateral margins.

The markings of the male are identical with those of the female but there is a marked difference in size, the male being much the smaller.

Measurements of the male: body, length 1.77 mm., width .65 mm.; head, length .48 mm., width .47 mm.

Numerous specimens of both male and female were collected from the American Magpie (*Pica pica hudsonica*), at Ft. Robinson, Neb., Dec. 14, 1895, by W. D. Hunter.

These specimens are close to the species as described by Piaget from *Pica leucoptera*, and on account of the striking coloration might at first glance be taken for the original species. However they differ in size, in the width and intensity of the abdominal markings and the markings of the temples. The female was not seen by Piaget.

Nirmus infrequens, sp. nov. (Plate XX, Fig. 3.)

Female.—Length 1.45 mm., width .4 mm.; head elongate cordate with the peculiar V-shaped ocular bands common to these forms; thorax with lateral, marginal bands and metathorax with internal bands; abdomen with widely broken lateral bands and heavy median transverse bands; whole body clear except the head, which is pale brownish.

Head, length .46 mm., width .29 mm.; front broadly parabolic, one hair a short distance in front of the trabeculae, which are very minute and colorless; eye slightly convex, with a very small bristle at the posterior angle; temples with one long hair and a short bristle; occiput slightly concave, naked, with a narrow dark border; no clypeal signature, but a clear oral fossa, expanding laterally as it approaches the mandibles; whole head narrowly bordered with blackish-brown, shading inwardly; antennal bands bending inward at trabeculae for nearly one third the width of the head, then straight back to the margin at the eye, where it meets the heavy temporal band; a light brown shield-shaped occipital signature; antennae with the first two segments longest and the whole uniformly brown.

Prothorax small, angles rounded; heavily bordered laterally with blackish-brown, the bands extending around on the posterior border, narrowing and nearly meeting on the median portion; a large clear pustule without hair in the posterior angles and a short weak hair. The coxal lines show through very distinctly. Metathorax about the same length as the prothorax but much broader; sides rounded and widely diverging; posterior border rounded, with six long hairs on each side; a dark spot in the anterior angles and a heavy irregular blotch extending inward from the posterior angles, narrowing and nearly meeting in the middle of the segment.

Abdomen subclavate, sides of posterior half nearly parallel and tapering abruptly at the eighth segment; the posterior angles projecting, nearly colorless and with one rather long and one short hair; eighth segment with hairs along the lateral and posterior margins; ninth segment naked; segments one to eight with a dark blackish-brown patch in the anterior half of the lateral margins and projecting anteriorly into the adjacent segment; internal clear portion obscured by heavy, median, transverse

bands, separated by clear sutures except between segments six and seven, and seven and eight, where it forms a continuous patch, narrowing posteriorly to the border of the eighth, where it widens into a narrow crescent; transverse bands also separated transversely by pale transverse bands through their middle; ninth segment colorless, with a slight median emargination on the posterior border. Legs short and stout, brownish throughout, with slightly darker anterior margins.

One adult female and one immature female secured from one individual out of a large number of specimens of Lapland Longspur (*Calcarius lapponicus*), found dead at Wray, Colo., November 16, 1901, by Prof. Lawrence Bruner and Dr. R. H. Wolcott. These birds had been killed by flying against telegraph wires.

This form resembles in many respects Osborn's *picturatus*, but differs greatly in having the lateral bands of the abdomen reduced to brownish-black blotches in the anterior angles of the segments instead of a continuous band. As Osborn gives no measurements I am unable to compare it in this respect with his species.

Nirmus angustifrons, sp. nov. (Plate XXI, Fig. 2.)

Female.—Body, length 1.37 mm., width .32 mm.; body slender, head narrowly parabolic in front, dusky, with blackish linear antennal bands and V-shaped ocular blotches; abdomen subparallel with heavy median bands and lateral bands reduced to a dark spot in the anterior angles of the segments.

Head, length .32 mm., width .22 mm., pale brownish throughout; front narrowly parabolic, with one short hair in front of trabeculae; ocular emargination slight; temples rounded, with one short hair; occipital margin slightly concave; trabeculae uncolored, minute; eyes small, without hair; antennae long, subparallel, segments 1, 2 and 5 subequal, 3 and 4 shorter, equal; antennal bands narrow blackish, submarginal, not reaching the tip of head; two linear blackish ocular blotches forming V-shaped marks on each side of head at the ocular emargination; margin of temples darker, shading inward; a clear oral fossa constricted midway from tip to mandibles, then widening abruptly to side of mandibles, which are large and deep chestnut; a small circular occipital signature; occipital bands pale.

Prothorax quadrangular, with angles and sides rounded; posterior angle with a very short hair; a broad submarginal band running around on the lateral and posterior sides, pale in its anterior portion, deep brown along the posterior transverse portion; a clear pustule without hair within the posterior angles.

Metathorax longer than prothorax, with sides rounded and broadly diverging; posterior margin angulated on the abdomen, with three long hairs on each side near the angles; a dark brown blotch in the anterior angles, and large, irregular, submarginal blotches running inward from the posterior angles; the whole thorax slightly tinged with brownish.

Abdomen large, sides subparallel, ground color of segments clear and translucent; posterior angles very slightly projecting, without hairs on first two segments; segments 3-6 with one hair; 7 and 8 with three, also four along the posterior margin of the eighth; lateral bands reduced to a deep brown spot in the anterior angles of segments

2-6; heavy, blackish-brown, median transverse bands in segments 1-8, much paler, however, in segments 1 and 2; all darker along the posterior portion and separated by a clear transverse band in the posterior portion of the segments; a narrow, clear, median stripe separates them longitudinally, except in the eighth segment; ninth segment small, rounded and slightly emarginate at the tip.

Legs short and stout, especially the femora; darker than the body, being the same color as the head with darker annulations and semi-annulations on the femora and tibiae.

Numerous females collected from specimens of the Western Lark Sparrow (*Chondestes grammacus strigatus*), in the Little Bad Lands, Sioux Co., Neb., June 17, 1901.

This form seems to have little resemblance to any species hitherto described, and is easily recognized by the long, narrow, dusky head, the absence of lateral abdominal bands and the heavy, median, transverse, abdominal bands.

Nirmus trimarginis, sp. nov. (Pl. XX, Fig. 2; Pl. XXI, Fig. 5.)

Female.—Body, length 1.87 mm., width .61 mm.; head triangular, front narrowly truncate; prothorax short, quadrangular; metathorax short, with widely diverging sides; abdomen almost a perfect oval, narrowly margined with deep chestnut.

Head, length .5 mm., width .5 mm.; triangular, slightly swollen at trabeculae; front sharply conical, with sides straight and clypeus squarely truncate; two short hairs just behind the lateral angles of the clypeus, one at the suture and one in front of the trabeculae; trabeculae slender, clear, bluntly pointed, and equal to the first segment of the antennae; antennae rather short and slender, first segment thickest, second longest, nearly as long as the last three combined, which are uniformly darker; eye small, scarcely perceptible, obscured by a blotch and furnished with a long stout hair; temples rounded, with two long hairs in large pustules, and several short bristles; occipital margin concave with the occiput slightly convex; the chestnut antennal bands narrow, broken at the suture and extending nearly to the lateral angles of the clear clypeus, while the posterior portion, bending angularly inward at the trabeculae, passes backward to, and joins at the middle portion, the somewhat broken occipital bands; temples narrowly edged laterally with deep chestnut.

Prothorax short, quadrilateral, narrower in front, with the anterior angles flatly rounded and the sides nearly straight, but slightly diverging; posterior angles rounded, with one long hair; whole segment rather indistinctly margined with dull chestnut, while the coxal lines are large and plainly visible. Metathorax scarcely longer than prothorax, sides rounded and widely diverging; posterior margin angulated with several pustulated hairs on each side; a dark blotch at the anterior angles, and a broad band along the lateral margins, extending inward from the posterior angles.

Abdomen an almost perfect oval, slightly pointed posteriorly, widest at fourth and fifth segments; posterior angles projecting, with one hair, except on the first, eighth and ninth segments which have none; segments two to seven sharply and narrowly margined with deep, blackish chestnut, projecting into the adjacent anterior

segments; the median portion slightly obscured by a continuous, fulvous, longitudinal band, fading gradually laterally; segments two to six with a median, narrow, dark brown, transverse band, slightly posterior to the middle portion of the segment; ninth segment bluntly pointed, clear, with a slight median emargination; a median transverse row of long hairs along the middle line of segments one to seven. Legs short, rather stout, concolorous with body and with narrow, broken chestnut bands along the anterior borders of femora and tibiae.

The male differs considerably in several respects from the female. The head and thorax being paler, the sides of the metathorax straight (though diverging), while the abdomen is shorter and almost clavate; the genital hooks small and blunt while the whole body is much smaller than that of the female.

Measurements: body, length 1.4 mm., width .5 mm.; head, length .44 mm., width .44 mm.

One female, one male and three immature males collected from a Rocky Mountain Creeper (*Certhia familiaris montanus*), by Professor Lawrence Bruner at Harrison, Neb., Feb. 17, 1896.

This form resembles *gulosus*, described by Nitsch from *Certhia familiaris* (European form), and while his description is somewhat meagre, enough is given to distinctly separate it from this form.

Colpocephalum quadrimaculatus, sp. nov. (Plate XXI, Fig. 4.)

Male.—Body, length 1.17 mm., width .49 mm.; whole body pale, with blackish head and ventral thoracic markings in addition to the brownish spots and bands of the head, thorax and abdomen; abdomen with heavy lateral bands and median transverse bands nearly reaching the lateral bands and separated by clear sutures.

Head, length .27 mm., width .41 mm.; front broadly and regularly rounded beyond the anterior margin of the antennal fossae; terminal segment of the palpi projecting; two short and two longer hairs in front between the palpi; one short one at the palpi; one short and one very long one just behind the palpi, and two long ones at the anterior margin of the antennal fossae; anterior and posterior angles of the temples rounded; occipital margin deeply concave, with occiput slightly convex; eye undivided, nearly obscured by a black fleck; ocular fringe short and rather sparse for the genus; temples with four very long hairs, one short one and a bristle; mandibles small and pointed, blackish; a black blotch at the base of the palpi and along the inner margin of the antennal fossae; a brownish band connecting the black blotches at the palpi; curving bands from the same point to the anterior angles of the occipital signature; occipital signature large and continuous with a median longitudinal band on the prothorax; a narrow, black, submarginal occipital border; whole head clear with the exception of the above-mentioned markings.

Prothorax hexagonal, wider than long, with rounded, protruding lateral angles furnished with a short bristle; sides converging posteriorly (but not quite as much as shown in the plate); a blackish blotch at the anterior angles, connected by a brown transverse band; a broad median longitudinal brown band, narrowing abruptly to a point near the posterior margin of the segment, and with narrow brown bands (not shown in plate) diverging from the point where the posterior constriction begins, to

the lateral angles; a brownish marginal band fading posteriorly runs backward from the lateral angles; narrow, black, ventral bands (showing through from beneath) running from the lateral angles to the anterior angles, and from there backward to the posterior portion of the median, longitudinal band; coxæ visible from above. Metathorax large, with sides straight and diverging, posterior angles with one long and two short hairs; posterior margin rounded, with four long hairs; a circular brown blotch at the median portion of the anterior margin, projecting over into the prothorax; another larger, somewhat quadrangular blotch in the posterior median portion of the segment; the two posterior pairs of coxæ showing through very distinctly as black circular lines; narrow black bands on the ventral surface as follows: one long curving band from the anterior angles to the middle of the first abdominal segment; one along the anterior border from the angles inward to the border of the median circular blotch, then straight backward to the middle of the segment; lastly a transverse, intercoxal band from the middle of the curving lateral bands inward to the tip of the longitudinal band and then curving backward to the margin of the segment.

Abdomen oval, with posterior angles slightly projecting and furnished with one long and one short hair on segments one to four and six and seven; two short ones on segment five, two long and one short one on segments eight, and two long ones in the middle of the eighth segment, which has the appearance of being divided transversely; posterior margins of the segments slightly curving anteriorly, with a fringe of short, unpustulated hairs; lateral bands of segments dark brown, broad and slightly broken at the sutures; heavy, median, transverse bands, nearly reaching the lateral bands, and broken by clear sutures, except between the eighth and ninth segments; ninth segment large, longer than the others, with rounded posterior margin and darkened tip; genital hooks large and heavy, extending from the fifth segment to the tip of the abdomen.

Legs long and stout; femora swollen, especially the anterior pair, with several short hairs along the anterior margin; all with darkened base and tip and with a large clear pustule near the base (not shown in the plate on the two posterior pairs); tibiæ slightly swollen, and darkened at the tip, where there is also a clear pustule; a fringe of short hairs near the tip on the inner side; tarsi with the first segment short, the second long and stout; ground color of legs the same as body, a very pale testaceous.

A single male collected from an American Crossbill (*Loxia curvirostra minor*) at Warbonnet Cañon, Sioux Co., Neb., June 17, 1901. This is the first record of any species of *Colpocephalum* being collected from this host and the species is quite distinct, though it has a somewhat superficial resemblance to the general color and outline of *laticeps* Kell., but it is very readily recognized by the bold blackish bands on the ventral surface of the thorax, which show nearly as plainly from above as below.

Physostomum picturatus, sp. nov. (Pl. XXIII, Fig. 3.)

Female.—Body, length 2.9 mm., width .65 mm.; almost white, except a tint of golden on the prothorax and a few dusky median spots on the abdomen; with heavy blackish borders to the abdomen and thorax.

Head, length .67 mm., width .55 mm.; front slightly swollen laterally and flatly convex, without hairs; sides nearly straight from eyes to the swelling of the front; eye distinct, completely filling the ocular emargination; occipital angles acuminate, nearly reaching the lateral angles of the prothorax, and with two slender weak hairs; palpi projecting beyond sides of head by nearly last two segments; a darker band across the clypeus just in front of the palpi, on which are five short, stiff, dorsal hairs; a short marginal hair at anterior end of antennal fossæ, and two short bristles on the anterior margin of antennal fossæ. Markings similar to *australe*, but narrower and connected by a dusky band; a black blotch bounding the inner side, only, of the antennal fossæ, there being merely a black line bounding the outer margin; margin of temples narrowly dusky; a narrow black occipital border, broken medially.

Prothorax hexagonal, angles rounded; lateral angles with one weak hair and two bristles; a heavy blackish-brown border laterally; two internal, parallel, brown lines longitudinally; bold black lines curving from lateral borders to anterior angles of metathorax; a long slender hair on posterior angles.

Metathorax longer than prothorax; light golden-brown; sides sinuated, with one slender hair at posterior angles. Anterior border and angles heavily banded with blackish, broken medially; submarginal lateral bands continuous with lateral bands of abdomen, and cut medially by a curving black band, from whose outer anterior margin runs a lighter brown band nearly to anterior margin of segment. Legs rather slender, concolorous with body.

Abdomen with nearly parallel sides, truncate anteriorly, with sharply marked, heavy, pitchy-brown marginal bands, extending to the end of the eighth segment; posterior angles with a single slender hair; vulva convex, margined with short hairs. A pale brown median blotch on fifth and sixth segments.

Two females from an Orange-crowned Warbler (*Helminthophila celata*), Lincoln, Neb. Resembles *angulatum* somewhat in the markings of the prothorax, but has the heavy lateral bands of the abdomen, marginal, as in *diffusum*, and is much smaller than either.

Nitzschia pulicaris var. **tibialis**, var. nov. (Pl. XXII, Figs. 4, 5.)

Female.—Body, length 2.5 mm., width .95 mm.; head, length .5 mm., width .66 mm.; front broadly rounded, with a slight emargination just behind the projecting palpi; temples angular before and behind, with four long, pustulated hairs; occipital margin emarginate, with occiput convex, having four pustulated hairs arising from within the narrow occipital band; palpi projecting by a portion of the third and the fourth segments; front, between the palpi, with four short hairs; one short and two long hairs on each side at the anterior margin of the antennal fossa; ocular fringe distinct; a dark band bordering the inner margin of the antennal fossa and passing around the temples; occipital bands parallel, running to the base of the mandibles; a short band running from mandibles to the margin at palpi; between the occipital bands is a quadrilateral, formed by narrow bands, with bands running from its anterior angles to the occipital bands near their junction with the mandibles, also bands connecting its posterior angles with the base of the occipital bands.

The prothorax hexagonal, lateral angles protruding and rounded, with one long hair and two short bristles; anterior margin sinuated, with a narrow marginal band;

submarginal lateral bands running backward from the lateral angles and paling posteriorly; a median transverse band connecting lateral bands and also a V-shaped internal band with its upper ends uniting with the lateral bands near the anterior angles. Metathorax longer than prothorax; the suture between the meso- and metathorax plainly visible both on the dorsal surface and at the lateral margins; posterior margin slightly angulated, with a fringe of short hairs; whole segment dusky with darker anterior and lateral, marginal bands; posterior angles with two rather long hairs.

Abdomen large, oval, slightly inclined to be clavate; segments subequal, with slightly projecting posterior angles having three hairs of different lengths, except in the first and ninth segments, which have but two; segments one to eight with heavy lateral bands, slightly clearer at the sutures, and the posterior margins with a fringe of short, unpustulated hairs; ninth segment much narrower, quadrate, and with the posterior portion clear and fringed with fine hairs; whole interior of abdomen evenly dusky, not broken at the sutures.

Legs long and slender, except the front femora, which are greatly dilated, being almost orbicular; first and second pairs of femora with several short hairs on the anterior and posterior margins; posterior femora with a submarginal row of fine hairs along the anterior side for nearly the entire length of the segment; tibiae with a few short hairs along the margins and with dark, slightly broken, borders to the two anterior pairs; posterior tibiae very slender, parallel-sided, and without marginal markings; first joint of tarsi short, second long and stout.

The male is much smaller than the female; head not quite so broad in front; abdomen oval; the hairs of the posterior angles much shorter, except on the fourth, seventh, eighth, and ninth segments, where they are extremely long; the posterior femora are as long as in the female, and more swollen; the posterior tibiae are twice as long as the two anterior pairs, being as long as in the female, swollen apically and heavily margined with deep brownish, slightly broken near the tip; the genital hooks are long and slender, reaching from the middle of the fifth segment to the tip of the abdomen.

The male measures: body, length 1.96 mm., width .75 mm.; head, length .45 mm., width .61 mm.

Four males and one female collected from two individuals of the White-throated Swift (*Aeronautes melanoleucus*) at Warbonnet Cañon, Sioux Co., Neb., May 30, 1901. It resembles *N. pulicaris*, and differs chiefly in the absence of the darker transverse, abdominal bands and the pustules of the dorsal, abdominal hairs.

Trinotun conspurcatum *Nitzsch*. (Plate XXI, Fig. 3.)

This species resembles *T. luridum*, but is easily distinguished by the darker background, the larger size, the narrower, clear, transverse bands at the abdominal sutures, and especially by the fact that the dorsal hairs of the abdomen arise from large clear pustules which is *not* the case in *luridum*.

My specimen measures : body, length 5.37 mm., width 1.8 mm.; head, length 1.07 mm., width 1.50 mm.

A single female collected from a whistling swan (*Olor columbianus*) shot at Nebraska City, Neb., Nov. 22, 1900. This specimen agrees very closely, indeed, with the excellent description and plate which Piaget gives, the only appreciable difference being in the slightly smaller size. Although his figure could hardly be improved upon, a drawing of my specimen is given for the benefit of those to whom Piaget's plate may not be available.

Akidoproctus *Piaget*.

The following is a somewhat condensed form of the generic description as given by Piaget: The clypeus of great width with an indentation in the place of the signature of the *Docophori*; clypeus not distinct; the antennal fossa shallow and not extending in front of the trabeculæ; the antennæ almost uniform in the two sexes, short and thick, the segments decreasing in size to the tip; eye projecting, without hairs,* the temples long, rounded behind, with some weak bristles; occipital bands distinct, parallel.

The prothorax subquadrangular; metathorax wider than the head (except in *marginatus*), acuminate on the abdomen; the legs similar to *Nirmus* except greater length, especially of tibiæ.

Abdomen elongate-oval, naked except at the angles, with a large transverse furrow between the segments and the bands separated by a median, longitudinal, clear line; the last two segments, sharply separated from the seventh, form a small cone partly truncate or rounded (♂), pointed or rounded (♀); the genital organs of both sexes similar to *Nirmus*. The individuals are rarely met with and so far only on palmipeds, except *bifasciatus* which has probably straggled to a *Dromias ardeola*.

This genus has heretofore been found only in Europe and the finding of specimens of it upon a Canvasback Duck (*Aythya vallisneria*), at Lincoln, Neb., was quite a surprise. The specimens were collected by J. C. Crawford, Jr., from a bird killed by J. S. Hunter, and kindly turned over to me by Mr. Crawford for description.

The first species of this genus recorded was described by Nitzsch

* This statement is either an error or else not a generic character, because the species which I have described has a very strong hair on the dorsal surface of the eye.

and placed provisionally by him under the genus *Lipeurus*. Burmeister placed it under *Nirmus* and Giebel followed his example; thus it remained for Piaget to create a new genus for it, and other species of the same type described by him. This he did in his *Les Pediculines*. Of the genus, he says: "Since there has been added to the unique species described by Giebel three and probably four new species of the same type, I do not hesitate to establish for them the genus *Akidoproctus*, of which the distinctive characters are: The indentation of the clypeus, the existence of a second internal band on the abdomen and the conical form of the last two abdominal segments."

***Akidoproctus kelloggi*, sp. nov.** (Pl. XXII, Figs. 1, 2.)

Male.—Body, length 3.5 mm., width .8 mm.; whole body pale testaceous with black and varying shades of brown markings on head, thorax and abdomen.

Head, length .76 mm., width .64 mm.; elongate cordate, rather broadly rounded in front with six short bristles on each side between the trabeculae and the clypeal notch; one short bristle on each side just within the opening of the notch; temples with one weak hair and five short bristles; occiput deeply concave, slightly sinuated and naked; eye prominent, convex, colorless, and, contrary to Piaget's generic characterization, has a large stiff bristle upon the dorsal surface; antennae with the second segment longest, each segment semi-annulated with darker testaceous; a dusky spot on each side of the clypeal notch; a heavy reddish-brown band across the dorsal surface, joining the trabeculae and passing over the mandibles; a blackish ocular blotch and another of the same color at the base of the antennae on top of the brown transverse band; occipital bands heavy at base and blackish, narrowing and fading to the base of the mandibles; a pale, somewhat crescent-shaped clypeal signature.

Prothorax short, quadrilateral, with rounded angles, and convex sides; anterior angles with a blackish-brown, submarginal blotch joining the base of the occipital bands; a lateral submarginal band of the same color, passing around on the posterior borders for a short distance where it is joined by the lateral metathoracic band; the brown coxal bands showing through very plainly. The metathorax longer than prothorax and nearly twice as wide; sides rounded and widely diverging; posterior margin sharply angulated with a few weak bristles; a pair of long hairs at the middle on each side and three at the posterior angles; heavy black lateral bands separated from the black lateral abdominal bands by a clear space; the brown coxal lines showing through very plainly.

Legs short, rather slender, concolorous with body and with blackish tarsi and tips of tibiae.

Abdomen elongate-oval, constricted posteriorly and widest at the second segment; lateral margins of each segment convex, more so posteriorly; heavy black lateral bands widely broken by clear sutures; posterior angles scarcely projecting, with two or three short hairs; a longitudinal, clear, submarginal band parallel to the black lateral bands; remainder of abdomen pale fulvous; segments one to seven with a

darker, quadrilateral spot on each side of the median line, not touching the posterior margin of the segment, and each, in the first three segments, containing a still darker crescent-shaped band opening outward; in segments four to six, a median, transverse, blackish-brown band, widening laterally to the width of the segments; eighth segment with a median dusky spot and the lateral band extending inwardly along the posterior margin; ninth segment almost completely blackish-brown, with a small median, terminal emargination and two hairs on each side; the genital hooks are rather small, extending from the posterior margin of the sixth to the posterior margin of the eighth segment.

The female differs considerably from the male, especially in the markings of the abdomen. The abdomen is without the marked constriction posteriorly, widest at the third segment; without the median bands on segments four to six; the legs are stouter; the sixth and seventh segments of the abdomen have a continuous median blotch, while the ninth is more pointed and clear in the median portion; the lateral bands of the eighth segment are very narrow. Measurements as follows:

Body, length 3.65 mm., width .72 mm.; head, length .77 mm., width .65 mm.

Five males and one female collected from a Canvasback Duck (*Aythya vallisneria*), shot at Lincoln, Neb., March 25, 1901. Piaget's *bifasciatus* resembles this new form more than any other species of the genus, but it differs in the shape of the abdomen and thorax and in the abdominal markings.

EXPLANATION OF PLATES.

PLATE XX.

- Fig. 1. *Docophorus cephalosus*, sp. nov. (♀.)
- Fig. 2. *Nirmus trimarginis*, sp. nov. (♀.).
- Fig. 3. *Nirmus infrequens*, sp. nov. (♀).
- Fig. 4. *Nirmus truncatus*, var. *magnocephalus*, var. nov. (♀).

PLATE XXI.

- Fig. 1. *Nirmus biocellatus* var. *nigropictus*, var. nov. (♀).
- Fig. 2. *Nirmus angustifrons*, sp. nov. (♀).
- Fig. 3. *Trinoton conspurcatum* Nitz. (♀).
- Fig. 4. *Colpocephalum quadrimaculatus*, sp. nov. (♂).
- Fig. 5. *Nirmus trimarginis*, sp. nov. (♂).

PLATE XXII.

- Fig. 1. *Akidoproctus kelloggi*, sp. nov. (♂).
- Fig. 2. *Akidoproctus kelloggi* (♀).
- Fig. 3. *Physostomum picturatus*, sp. nov. (♀).
- Fig. 4. *Nitzschia pulicaris* var. *tibialis*, var. nov. (♂).
- Fig. 5. *Nitzschia pulicaris* var. *tibialis* (♀).



Carriker, Melbourne Armstrong. 1902. "Descriptions of New Mallophaga from Nebraska." *Journal of the New York Entomological Society* 10, 216–229.

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