

MALLOPHAGA FROM BIRDS OF THE PACIFIC COAST OF NORTH AMERICA.

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(PLATE III.)

The Mallophaga identified and described in this paper were collected by the authors, or by various students of zoölogy and entomology in Stanford University, from North American birds mostly taken on the Pacific Coast. The majority of hosts were shot in Alaska and California. Only those specimens in this miscellaneous collection of Mallophaga are referred to in this paper which are representatives of new species or which establish a new host record or new locality record for a previously known species. For each species previously described a reference to the original description is given and also a reference to the place of this species in a List of Biting Lice (Mallophaga) taken from birds and mammals of North America, by Kellogg (Proc. U. S. Nat. Mus., Vol. XXII, 1899, pp. 39-100) in which all of the American records, with hosts (together with the foreign records with hosts, if the species has been found outside of North America) are given for each species.

New Mallophaga I, II and III repeatedly referred to in this paper were published as Contributions of the Hopkins Seaside Laboratory of Stanford University as follows: Kellogg, New Mallophaga I, 1896, 137 pp., 14 plates, as No. IV of the Contributions; Kellogg, New Mallophaga II, 1896, 117 pp. 14 plates as No. VII of the Contributions; and Kellogg, Chapman and Snodgrass, New Mallophaga III, 1899, 224 pp., 17 plates, as No. XIX of the Contributions.

Docophorus melanocephalus *Burmeister*, Handb. d. Ent., II, 1839, p. 426; KELLOGG, List of Mallophaga, 1899, p. 44.
From *Sterna forsteri* (Leech Lake, Minnesota).

Docophorus fusiformis *Denny*, Monograph, Anoplur. Brit., 1842, p. 84, pl. I, fig. 2; KELLOGG, List of Mallophaga, 1899, p. 46.
From *Tringa coues* (Kadiak Island, Alaska).

Docophorus fuliginosus *Kellogg*, New Mallophaga, I, 1896, p. 80, pl. III, fig. 2; List of Mallophaga, 1899, p. 47.
From *Puffinus creatopus* (California).

Docophorus speotyti *Osborn*, Insects Affecting Domestic Animals, 1896, p. 222, fig. 144; KELLOGG, List of Mallophaga, 1899, p. 48.
From *Asio accipitrinus* (Kadiak Island, Alaska).

The specimens, two males, are distinctly larger, especially broader, and more strongly marked than typical representatives of the species.

Docophorus ceblebrachys *Nitzsch*, ed. Giebel Zeitschr. f. Ges. Naturwiss., 1861, XVII, p. 528; KELLOGG, List of Mallophaga, 1899, p. 48.

From *Surnia ulula* (Minneapolis, Minnesota).

Docophorus communis *Nitzsch*, Germar's Mag. d. Ent., III, 1818, p. 290; KELLOGG, List of Mallophaga, 1899, p. 50.

From *Junco hyemalis thurberi* (Palo Alto, California), *Lannis* sp. (Palo Alto, California; Kadiak Island, Alaska), *Pica pica hudsonica*, and *Pinicola enucleator* (Kadiak Island, Alaska).

Docophorus distinctus *Kellogg*, New Mallophaga, II, 1896, p. 477, pl. LXV, fig. 5; List of Mallophaga, 1899, p. 50.

From *Corvus corax principalis* (Kadiak Island, Alaska).

Docophorus rutteri *Kellogg*, Mallophaga from Birds from Panama, Baja California, and Alaska, in New Mallophaga, III, 1899, p. 12, pl. I, fig. 3; List of Mallophaga, 1899, p. 52.

From *Parus atricapillus septentrionalis* (Kadiak Island, Alaska).

Nirmus fissus *Nitzsch*, Germar's Mag. Ent., III, 1818, p. 291; KELLOGG, List of Mallophaga, 1899, p. 54.

From *Aegialites semipalmata* (Pacific Grove, California).

Nirmus complexivus *Kellogg & Chapman*, Mallophaga from Birds of California, in New Mallophaga, III, 1899, p. 75, pl. VI, fig. 3; KELLOGG, List of Mallophaga, 1899, p. 54.

From *Tringa couesi* (Kadiak Island, Alaska).

Nirmus incœnis *Kellogg & Chapman*, Mallophaga from Birds of California in New Mallophaga, III, 1899, pl. VI, fig. 5; KELLOGG, List of Mallophaga, 1899, p. 55.

From *Tringa couesi* (Kadiak Island, Alaska).

Nirmus luprepes, sp. nov. (Plate III, Fig. I.)

Description of female. Body, length, 1.63 mm., width .45 mm.; body pale brown with narrow black marginal markings.

Head, length .4 mm., width .35 mm.; elongate, triangular with clypeus narrowly

rounding, the uncolored region expanding slightly in front of the sutures; four marginal hairs, one in the rounding anterior angle of the clypeus, one just behind this, one at the suture, and one in front of the trabeculæ; trabeculæ prominent; antennæ short, reaching barely two-thirds of the distance to the occipital margin, first three segments almost uncolored, last two distinctly fulvous; eyes flat with short prickle and long slender hair; temporal margins broadly rounding, with two long hairs and a short stiff prickle on the margin; occipital margin slightly concave; clypeal signature shield-shaped, constricted slightly anteriorly; anterior half fulvous, posterior half almost uncolored; antennal bands distinct, dark brown and interrupted at the suture, posterior extremity bending sharply in; temporal borders narrow but distinctly dark brown growing paler toward the occipital border.

Prothorax quadrangular; sides slightly diverging; posterior angles rounding with one short hair; marginal borders dark golden brown; median portion pale fulvous. Metathorax with widely diverging sides, strongly angulated on abdomen; lateral angles with three long pustulated hairs, postero-lateral margin with two long pustulated hairs, narrow dark brown marginal markings, anterior extremities bending strongly inward, dark marking broadening in posterior angle. Legs concolorous with the palest color of the thorax; darker brown annular markings.

Abdomen elongate elliptical, posterior angles of the segments slightly projecting; one or two hairs in posterior angles after first segment; four long pustulated hairs on the posterior margin of the segments, two long hairs being near the posterior angles and the other two on each side of the median line; segment 8 with four long pustulated hairs along the lateral margin, segment 9 angularly emarginate with a few very short and one longer marginal prickle. Color fulvous with broad segmental median bands of dark brown to black, broad uncolored sublateral band and uncolored posterior margins on segments 1-8; segment 9 with two pale brown blotches.

From the turnstone, *Arenaria interpres* (Pacific Grove, Calif.) This *Nirmus* belongs to the group *interrupto-fasciata* hitherto found exclusively on passerine birds, especially birds of the finch family.

Nirmus splendidus Kellogg, Mallophaga from Birds from Panama, Baja California, and Alaska, in New Mallophaga III, 1899, p. 16, pl. II, figs. 3 and 6; List of Mallophaga, 1899, p. 56.

From *Polyborus cheriway* (Tampico, Mexico).

Liperus ferox Giebel, Zeitsch. f. Ges. Naturwiss., XXIX, 1867, p. 195; KELLOGG, List of Mallophaga, 1899, p. 59.

From *Diomedea nigripes* (North Pacific Ocean).

Liperus farallonii Kellogg, New Mallophaga I, 1896, p. 103, pl. V, fig. 4; List of Mallophaga, 1899, p. 60.

From *Phalacrocorax pencillatus*, and *P. resplendens* (Calif.).

Liperus mcithenyi Kellogg & Kuwana, Proc. Phil. Acad. Sci., 1900, p. 155, pl. VII, fig. 3.

From *Diomedea nigripes* (California). Previously recorded from same host, Pt. Barrow, Alaska.

Liperus comstocki, sp. nov. (Plate III, Fig. 2.)

Description of female. Body, length 3 mm., width .45 mm.; very long, slender, body no wider than head, fuliginous with dark brown to black marginal bands on the head, thorax and abdomen.

Head, length .45 mm., width .35 mm.; elongate, conical scarcely any wider through the tempels, front rounding, distinctly separated from the head by a suture; a short hair at the suture and two longer marginal hairs in front of the suture; sides of the front diverging but little, with a short fine marginal hair, in front of the small angular trabeculæ a short prickle; antennæ slender, first segment short, second almost as long as the third and fourth segments together; third cylindrical and longer than the fourth, a few short hairs on the segments and several at the tip of the last segment; color pale fuliginous, darker on last three segments; eye small but distinct with one prickle; temporal margins parallel, one short marginal prickle just below the eye, one more on the lateral margins of the temple and two short prickles and one long hair on the rounding temporal angle; occipital margin acutely concave; signature shield-shaped, extending to front margin of head, pale colored anteriorly, darker brown behind, a distinct suture extending from posterior angle along the median line not quite to the anterior margin of the signature; this suture extending posteriorly almost to the mandibles; antennal bands broad and dark with the anterior and posterior ends curving inwardly, temporal margins bordered with dark brown, paling inwardly.

Prothorax almost square, anterior angles rounding, bare; posterior angles acute with one short prickle; ground color fuliginous with uniform dark lateral bands which bend inwardly at the posterior angles. Metathorax quadrangular, longer than broad, slight restriction behind the anterior angle; posterior margin with a narrow acute median angle on the abdomen; five hairs in posterior angles. Legs robust with short hairs on tibiæ and femora; pale with narrow dark borders.

Abdomen long and narrow, segments gradually widening to the fourth, fifth and sixth about equal, ninth deeply and angularly emarginate, the two acute points with one strong hooked hair; posterior angles of the segments with one or two long hairs; each segment with a broad transverse band darker on the median line and a dark brownish black lateral band.

From *Rallus virginianus* (Ithaca, New York).

Oncophorus bisetosus *Piaget*, Les Pediculines, 1880, p. 217, pl. XVIII, fig. 4; KELLOGG (var. *californicus* K. & C.) List, 1899, p. 65.

From *Rallus virginianus* (Ithaca, N. Y.). A variety of this form previously recorded from the same host (Palo Alto, Calif.). The specimens in hand much more closely approximate the type, but show certain slight differences.

Læmobothrum loomisi, sp. nov. (Plate III, Fig. 3.)

Description of female. Body, length 9.7 mm., width 2.58 mm.; clear pale brown with dark brown markings.

Head, length 1.46 mm., width 1.66 mm.; large, broader than long, front margin truncate with many short and several longer hairs on the margin; one short and two longer hairs in the rounding angle near the suture, a few long weak hairs on the dorsal surface of the front; the front half on the distinctly convex margin of the antennal fossa bears three long hairs and several short spines, and the hinder half is without hairs save one that arises on the ventral surface and extends beyond the margin, and a few short spines just in front of the eye; eye small and round, inconspicuous; temporal margins diverging in an even line to a rounding angle where they curve in to meet the concave occipital margin; a series of six short stiff hairs on the front even margin of the temples; two long fine hairs in the rounding angle, two short spines just back of these, a single spine in the rounding angle of the occiput and temple; antennæ concealed in fossæ; labial palpi extending beyond the sides of the head nearly the length of three stout joints that are of nearly equal length, a short strong hair in the outer anterior angle of the third and fourth segments, color pale brown of the head, mandibles with dark tips on teeth; darker marginal bands on each side of the front fading inwardly to the mandibles; antennal fossæ rimmed with dark brown fading inwardly, lower inner half darkest brown curving in around the clear circular space through which the antennæ show; anterior margin of temples with a broad dark band, growing narrower on the posterior incurving margin of the temples; occipital margin with a narrow dark band, a dark median blotch on the head between the temples; posterior half of blotch broadly heart-shaped, anterior portion broad at median blotch but dividing into two narrow bands that diverge, growing pale as they approach the antennal bands, a clear uncolored circular space in middle of the blotch, and a clear V-shaped line about the posterior margin of the heart-shaped dark blotch.

Prothorax shorter than the head and not as wide as the head through the temples; anterior portion narrow fitting into the occipital cavity, a distinct constriction abruptly separates this anterior portion from the posterior portion; sides rounding, the posterior margin deeply emarginate, bearing the posterior angles as obtusely pointed, backward projecting processes overlapping the metathorax; series of short stiff spines on the margin of the outer anterior half (of the front margin) of the prothorax, one long slender hair in the anterior angle, one long hair in the angle at the constriction and a series of about nine long hairs along the rounding lateral margins, four shorter hairs and a spine in the obtuse posterior angles; ground color pale brown, anterior margin with a narrow band of darker brown that disappears at the anterior angles, dark brown to black on the lateral margin darkest at the constriction and the angle immediately posterior to it, growing very narrow and lighter at the posterior angles and on the posterior margins; a narrow uncolored median line extends the whole length of the prothorax with a pale brown band on each side, a narrow chitinous bar crosses the anterior half of the prothorax, meeting a broader lateral bar which curves inwardly from the anterior angle of the thorax, then down to the posterior portion where it curves in again to meet the narrow posterior brown band. Metathorax and mesothorax bell-shaped and continuous in outline with the abdomen, separated from each other by a distinct suture, anterior angles broadly rounding with two short hairs, sides gradually diverging, with a series of long and short hairs on the margin, posterior

margin of metathorax with four long postulated hairs; the ground color as in the prothorax, the anterior and lateral margins with broad blackish-brown band from which incurving projections extend, one pointed blotch curves in from each anterior angle; the uncolored narrow median line extends through the meso- and metathorax, the dark band each side of this widens with a broad pyramid-shaped blotch on the mesothorax and diminishes again on the metathorax, though the anterior portion of the metathoracic blotch is much darker brown; sternal markings of prothorax dark median blotch, anterior two thirds quadrangular, slightly concave on anterior margin; posterior portion drawn out in a narrow neck, whole blotch looking like a flat-sided bottle; intercoxal lines dark brown. Metathorax with median markings oval with anterior and posterior ends narrowly drawn out; posterior portion of the oval supported by broad dark lateral bars, anterior portion with gracefully curved bars like handles to a slender-naked vase. Legs large and strong, covered with long hairs and short spines; pale golden brown with dark brown markings.

Abdomen elongate, oval, sides sub-parallel, widest at fourth segment, no distinct marginal constrictions between the segments, a series of long and shorter hairs along the lateral margins of the body and a series of long postulated hairs on the posterior margin of each segment; last segment broadly rounded with a series of short marginal hairs and scattered dorsal hairs, color pale brown, dark brown lateral bands separated from the paler median portion by uncolored sub-marginal lateral bands; the narrow median uncolored line of the thorax shows in the anterior portion of the first three segments of the abdomen; the anterior portion of the median transverse blotches of the segments is darker brown.

One specimen from *Anser albifrons gambeli* collected in San Francisco by Leverett M. Loomis, curator of birds, California Academy of Science. The largest species of Mallophaga so far known, exceeding the length of *Lipeurus ferox* (from albatrosses) by about .5 mm., and its width by about the same.

Trinotum luridum Nitzsch, Germar's Mag. d. Ent., III, 1818, p. 300; KELLOGG, List of Mallophaga, 1899, p. 70.

From *Urinator pacificus* (California).

Ancistrona gigas Piaget, Les Pediculines, Supplement, 1885, p. 117, pl. XII, fig. 8; KELLOGG, List of Mallophaga, 1899, p. 71.

From *Puffinus creatopus* and *P. griseus* (California).

Colpocephalum maculatum Piaget, Les Pediculines, 1880, p. 516, pl. XLIII, fig. 1; KELLOGG, List of Mallophaga, 1899, p. 74.

From *Polyphorus cheriway* (Tampico, Mexico).

Colpocephalum funebre Kellogg, New Mallophaga, I, 1896, p. 147, pl. XII, fig. 7; List of Mallophaga, 1899, p. 72.

From *Larus glaucus* (California and Kadiak Island, Alaska).

Colpocephalum flavescens Nitzsch, Germar's Mag. d. Ent., III, 1818, p. 298; KELLOGG, List of Mallophaga, 1899, p. 73.

From *Haliæetus leucocephalus* and *Aquila chrysaetos* (Kadiak Island, Alaska).

Menopon infrequens Kellogg, New Mallophaga, I, 1896, p. 161, pl. XV, fig. 5; List of Mallophaga, 1899, p. 75.

From *Larus glaucescens* (California and Kadiak Island, Alaska).

Menopon funereum Kellogg & Chapman, Mallophaga from Birds of California, in New Mallophaga, III, 1899, p. 124, pl. VIII, fig. 6; KELLOGG, List of Mallophaga, 1899, p. 77.

From *Aphelocoma californica* (California).

Menopon kuwani, sp. nov. (Plate III, Fig. 4.)

Description of female. Body, length 2.22 mm., width 1 mm.; a very broadly oval body; color pale, translucent golden brown, without distinct markings, save almost circular ocular blotches of clear chestnut brown and dark tips of mandibles.

Head, length, .35 mm., width .65 mm.; broad through the temples, and sides curving evenly but rapidly to the slightly angulated front of the clypeus; one very short hair and one rather long and one shorter hair on the margin of each side of the angular point of the clypeus, a tiny prickle near the suture; two long and several shorter hairs on the swelling just in front of the very shallow ocular emargination; temples swelling but little below the ocular emargination, posteriorly forming a blunt angle with the occipital border which is concave; three long and two shorter hairs in the temporal angle and four long pustulated hairs on the occipital margin; color of head light-chestnut brown, with dark brown ocular blotches and black ocular fleck, dark chestnut markings where the tips of the mandibles show through the head; occipital margin with a narrow chestnut band, darkening into broad occipital blotches.

Prothorax broad, sides converging but slightly, anterior angles but little produced each with two short spines and a long hair; two long hairs and a short spine in the posterior angle and four long hairs on the slightly convex posterior margin; color pale even chestnut. Mesothorax short, sides rapidly diverging, metathorax distinctly separated from mesothorax by marginal constriction, but little wider than the prothorax; posterior angles with several short spines and the last of a series of long hairs on the posterior margin; color slightly paler than the prothorax. Legs of the palest color of the prothorax, and with several short stiff hairs on the femora and tibia.

Abdomen broadly elliptical, posterior angles projecting but little after the third segment, a few short spines and from one to two long hairs in the posterior angles; a series of long hairs on the posterior margin of each segment; last segment rounding with long hairs on the outer margin and a series of short stiff hairs along the rounding posterior margin; color paler than head and thorax but without darker markings.

From *Phalacrocorax penicillatus* (Calif.).

Menopon persignatum Kellogg & Chapman, Mallophaga from Birds of California, in New Mallophaga, III, 1899, p. 128, pl. IX, fig. 1;

KELLOGG, List of Mallophaga, 1899, p. 79.

From *Cyanocitta frontalis* (Mountain View, California).

Menopon mesoleucum *Nitzsch*, Germar's Mag. d. Ent., III, 181, p. 300; KELLOGG, List of Mallophaga, 1899, p. 78.

From *Corvus corax principalis* (Kadiak Island, Alaska).

Menopon alaskensis, sp. nov. (Plate III, Fig. 5.)

Description of female. Body, length 1.6 mm., width .6 mm.; general color, pale golden brown, with distinct dark brown ocular blotches.

Head, length .3 mm., width .45 mm.; semilunar with an evenly rounded front, distinct ocular emarginations, temporal margins narrowly rounding; occipital margin concave; a pair of short hairs near the middle of the front, a longer one on the side followed by a very short one, and then three longer ones in front of the emargination; ocular fringe composed of a few long hairs and short stiff hairs, and in the narrowly rounding temporal angles four long hairs and several short stiff ones; occipital margin broadly concave and with four long hairs; one long hair and two short ones on dorsal surface near anterior end of color blotches; dark brown to black ocular blotches (mandibles showing dark brown through the clear golden brown of the head), distinct black flecks in the eyes; a narrow dark brown occipital border broadening slightly each side of the median line.

Prothorax broad with lateral angles distinctly produced and bearing a long hair and two short spines, sides sloping rapidly to the flatly convex posterior margin, a short spine on the lateral margins and ten long hairs on the posterior margin; color pale golden brown with anterior angles darker fuscous; strong chitinous bars showing through body dark brown. Metathorax narrow anteriorly with rapidly diverging sides, a few spines on the lateral margins and a row of long hairs along the slightly convex posterior margin; mesothorax distinctly separated by a marginal constriction and a dark transverse line, a few strong spines and a long hair in the posterior angle and a series of long hairs on the posterior margin. Meta- and mesothorax with a broad, transverse fuscous band across the posterior half, and narrow darker lateral border; sternal markings composed of small median blotch on the prothorax with narrow darker lateral bars, dark inwardly curving intercoxal lines on the mesothorax, a broad median fuscous blotch on metathorax extending on to the first abdominal segment; many long hairs on the median blotches. Legs pale golden brown with darker brown markings, a number of short spines on the legs.

Abdomen elongate oval, posterior angles projecting but little, several short spines on the lateral margins of the segments with longer hairs in the posterior angles and along the posterior margin of each segment; last segment broadly convex with a series of fine short hairs, color pale golden brown with a broad fuscous, transverse band on each segment, a narrow darker lateral border and broad uncolored sutural lines separating the segments.

Many specimens from *Cinclus mexicanus* and *Pinicola enucleator* (Kadiak Island).

EXPLANATION OF PLATE III.

- Fig. 1. *Nirmus luprepea* K. & C., female.
Fig. 2. *Lipensis comstocki* K. & C., female.
Fig. 3. *Læmobothorium loomisi* K. & C., female.
Fig. 4. *Menopon kuwani* K. & C., female.
Fig. 5. *Menopon alaskensis* K. & C., female.

COCCIDÆ FROM THE GALAPAGOS ISLANDS.

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(PLATES IV AND V.)

In 1898-1899 Messrs. R. E. Snodgrass and Edmund Heller, assistant in entomology and advanced student in zoölogy, respectively, in Stanford University, spent six months on the Galapagos Island collecting animals and plants for the University. The plants thus collected were placed in the university herbarium, and not until recently were they examined for Coccidæ. During the winter recess, December, 1901-January, 1902, the writer found six species of scale insects on these plants, representing four genera. All of these species are described in this paper. No previous records of Coccidæ from the Galapagos Islands have ever been published.

The following are the names of the species described in this paper: Subfamily Orthezianæ, *Orthezia galapagoensis*, sp. nov.; Subfamily Asterolecaniinae, *Asterolecanium pustulans*; Subfamily Lecaniinae, *Lecanium hemisphæricum*, *Lecanium hesperidum pacificum*, var. nov.; Subfamily Diaspinæ, *Aspidiotus lataniæ*, *Aspidiotus smilacis*.

I have to thank Prof. W. R. Dudley for permission to examine the dried plants, and have also to acknowledge the courtesy of Prof. T. D. A. Cockerell in reading the MS. of this paper, examining specimens of the species herein described, and giving notes, published herewith, on these Galapagos Island Coccidæ.

This paper was prepared in the Entomological Laboratory of Stanford University under the direction of Prof. V. L. Kellogg.

Orthezia galapagoensis, sp. nov. (Plate IV, Figs. 1-4.)

Mature Female.—Antennæ 8-segmented, .76 mm. long, segment 8 longest, then 7, 6, 5, 4, 3 subequal, then 2 and 1, segment 1 being the shortest and thickest. Legs well developed; coxæ wider than long, stout; tibia longer than femur; tarsus one



Kellogg, Vernon L. and Cady, Bertha Chapman. 1902. "Mallophaga from Birds of the Pacific Coast of North America." *Journal of the New York Entomological Society* 10, 20–28.

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