

three irregular subterminal blotches between veins Cu_2 and M_2 ; a series of black dots along costa, increasing in size near apex; a small black patch at origin of veins Cu_1 and M_3 and a similar one on second anal vein obliquely below it; inner margin with several fine black strigae; on outer margin a series of black dashes, of which the apical ones are perpendicular to the margin, that between veins M_1 and R_5 being the longest and most prominent; the lower ones are oblique and bordered inwardly with white. Secondaries dark gray, lighter at base, with traces of marginal row of white spots; fringes on both wings checkered white and gray.

Beneath much as above; white subterminal patches less prominent; terminal black dashes very clear; secondaries, lighter than above, white, sprinkled heavily with gray; veins bordered terminally with a series of black dots.

Expanse, 29 mm.

Habitat.—Eureka, Utah (T. Spalding). 1 ♂. Type Coll. Barnes.

Somewhat similar to our species *palmata*, but differing in venation. As it was late to include a figure in our revision of North American Cossidae, just published, we reproduce it on the accompanying plate, together with *ethela* N. & D., of which species the above mentioned work only figures a very poor specimen, the only available one at the time.

Mallophaga from Islands off Lower California.

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The following determinations and descriptions of new species of bird-infesting Mallophaga are made from a collection taken by R. C. McGregor in 1897 from birds of the islands off the coast of Baja California. The determinations of the bird-hosts were made by McGregor, an accomplished ornithologist. The parasites were taken from the fresh bird specimens.

The collection is of special interest on account of the relation of the host species to the birds of the Galapagos Islands, from which two collections of Mallophagan parasites have been studied at Stanford (see "Mallophaga from Birds of the Galapagos Islands," by Kellogg and Kuwana, in Proc. Wash. Acad.

Sci. Vol. IV, pp. 247-260, Sept., 1921; and "A Second Collection of Mallophaga from Birds of the Galapagos and Revillagigedo Islands and Neighboring Waters," by Kellogg, in Trans. Amer. Ent. Soc., Vol. XXXII, pp. 315-324, Nov., 1906). The birds of the Galapagos Islands are believed to be descendants, either unmodified, or modified to be new species and new genera, of species of the western coast of northern South America, Central America and Mexico.

In the light of this presumption and in the light of the fact that those Mallophagan species found so far on more than one host species are usually found on related host species, the comparison of a Mallophagan collection from birds of the West Coast of America (south of the United States) with the full collections already made from the Galapagos birds might be expected to turn up a number of interesting cases of host distribution. And this expectation finds some realization in the present opportunity.

Of the Mallophagan species included in this collection from birds of the islands off Baja California, fifteen have been also recorded from birds of the Galapagos Islands. Among these cases of common occurrence the taking of *Docophorus speotyti* Osborn, recorded from *Speotyto rostratus* and *Speotyto hypogaea* from Baja California, from *Speotyto* sp. of the Galapagos Islands is of special interest, as is the taking from *Anous stolidus* of the Galapagos Islands of *Colpocephalum milleri* recorded from *Anous ridgwayi* from Baja California.

***Docophorus acanthus* Giebel.**

A single specimen from *Haematopus bachmanni*, San Benito Island.

***Docophorus lari* Denny.**

Two males from *Aechmophorus occidentalis*, Ensenada Isl.

***Docophorus platystomus* Nitzsch.**

Two specimens from *Haliaeetus leucocephalus*, Todos Santos Island.

Docophorus californiensis Kellogg var. *quadripustulatus* var. nov.

In the collection are four specimens that differ markedly from typical *californiensis* in having most of the hairs on the

all men distinctly pustulate and regularly arranged, four in a row. Equidistant on each side of the row, close to the posterior margin of the segment is an additional pustulate hair. On the sixth segment there are only two central hairs, and on the penultimate and last segments only the marginal hairs are pustulate. This variety is somewhat larger than the typical form (males 1.95 mm.). One male and one female from *Pipilo carmani*, Socorro Island; two specimens from *Conurus holochlorus*, Socorro Island.

Docophorus brevantennatus Piaget.

Three males and two females referable to this species, from *Phaethon aethereus*, Socorro Island. Another male from *Sula gossi*, San Benidicte Island. *Docophorus brevantennatus* approaches most closely *D. validus*, but the connected dorsal bands of the former will at once distinguish it.

Docophorus speotyti Osborn.

Five specimens from *Speotyto rostratus*, Clarion Island, and others from *Speotyto hypogaea*, San Benito Island.

Docophorus insolitus Kellogg.

Two males from *Ptychoramphus aleuticus*, San Geronimo Island.

Docophorus montereyi Kellogg.

A single specimen from *Brachyramphus hypoleucus*, San Benito Island.

Docophorus sp. juv.

Two specimens, too young to identify positively, probably undescribed, from *Haematopus frazeri*, San Martin Island.

Nirmus faralloni Kellogg.

One specimen from *Arenaria melanocephala*, San Geronimo Island.

Two specimens from *Larus heermanni*, San Geronimo Island.

Nirmus latifasciatus Piaget.

One specimen from *Haematopus frazeri*, San Martin Island.

Nirmus gloriosus Kellogg and Kuwana.

One male and two females from *Sterna anaetheta*, Socorro Island.

Nirmus cupreipes Kellogg and Chapman.

Male and female from *Arenaria melanoccephala*, San Martin Island.

Nirmus caracarensis n. sp.

Three males from a caracara, *Polyborus lentosus*, Guadeloupe Island. This specimen most closely approaches *N. splendidus* Kellogg, but differs in the much smaller size, the broadly rounded clypeus, and the markings. It is perhaps related both to *splendidus* and to *N. discocephalus* Nitzsch, and the three species form a group distinguished by the broad abdomen and rounded head. The three species infect raptorial birds. *Splendidus* was found on *Polyborus cheriway*.

Description of the male.—Body, length 1.76 mm.; width .73 mm.; form broad, color whitish with brown markings, thorax entirely brown, head broad and rounded and, except clypeus and signature, brown.

Head, length .57 mm.; width, .48 mm.; forehead broad between trabeculae, sides converging, straight to near front, which is broad and rounded; forehead with five short separated hairs on each side, trabeculae large for *Nirmus*; antennae short, uncolored; eye large, prominent with a long hair, and a fine prickle just behind it; temporal margins evenly rounded, with two long hairs; occipital margin concave; whole head except the signature and clypeus, brownish; antennal bands narrow, a little darker than the general color of head, running entirely around frontal margin of head, paler in front; trabeculae uncolored.

Prothorax short, with one hair in posterior angles; segment wholly colored; metathorax short, the whole thorax about one-half as long as head, and obtusely angulated on abdomen; two very long hairs on lateral margin, and posterior margin with two long hairs on each side; segment entirely grown; legs pale.

Abdomen ovate; posterior angles of segments 1 and 2 without hairs, segments 3 and 4 with a single hair, succeeding segments with two hairs; dorsal surface of each segment with about fifteen long hairs arranged in a single transverse row; posterior segments with fewer hairs, whitish with an uninterrupted transverse brown blotch on each segment; segment 9 rounded behind, with numerous longish hairs; uncolored except where the chitinized genitalia show through, the genital blotch not distinct.

Nirmus melanococcus Carriker.

Two females from *Mimodes greysoni*, Socorro Island. *Melanococcus* was described from a single female collected on

Piranga bidouata sanguinolenta in Costa Rica. Our specimens have a head much larger than that figured by Carriller, and may possibly be a distinct variety, but the *lividula* group (to which this species belongs) is at present too little known to justify the giving of names in it on slight differences.

Nirmus lucidus n. sp.

One adult female and two immature specimens from the marbled godwit, *Limosa fedoa*, Playa Maria Bay. This species is close to Osborn's *N. cordatus*, but the more general elongate form of *lucidus* will at once separate it from that species.

Description of females.—Length 2.2 mm.; width .6 mm.; elongate; color clear, with translucent brownish yellow markings; rather Lipuroid in general appearance.

Head, length .25 mm.; width .43 mm.; pale brownish yellow; sides slightly convex, and broadly rounded front; clypeus flatly rounded in front; trabeculae very small, colorless; antennae short and thick, colored same as head; eye flat, colorless, with one fine bristle; light-colored antennary bands converging in front, the space between them clearer but with darker triangular mark; mandibles light brown in color.

Prothorax small, sub-quadrangular, sides convex; narrow light brownish-yellow lateral bands almost unite at middle of posterior margin; coxal markings showing through as brownish yellow blotches. Metathorax larger, form similar to that of prothorax, except for obtusely angulate posterior margin; marginal bands distinct, though faintly colored; hairs on side very weak; coxae showing through as brownish yellow blotches; legs stout, tibiae brownish yellow, femora with large yellow spot, otherwise colorless.

Abdomen elongate elliptical, widest at fourth segment; posterior angles of segments little rounded, with a single marginal hair except on the first two segments; dorsum with short scattered hairs; color clear without marginal bands; transverse blotches light yellowish brown in color, extending width of segments, not interrupted; last segment with very faint blotch.

Nirmus nesiotus sp. nov.

One female from *Haematopus bachmani*, San Martin Island. This new *Nirmus* approaches Piaget's *coniceps* and Carriker's *rhamphasti*, the first from a hornbill, the other from a toucan. It is rather remarkable to find such closely related Mallophagous species on birds as widely separated as to relationship.

The new species is closest to *rhamphasti* but can be distinguished from it by the more elongate form, the testaceous protibrachial bristles, only slightly interrupted at middle, the more elongate head, and the head markings.

Description of female.—Body, length 2 mm., width .66 mm., moderately robust, for the most part clear with distinct testaceous markings and a piceous brown abdominal margin.

Head, length .75 mm.; width .48 mm.; front conical, broad, slightly concave at apex; sides slightly concave with four short hairs; clypeus clear, slightly emarginate in front; trabeculae short, colorless; antennae colorless, short, of medium thickness, the second segment longest; temples little rounded, expanded slightly anteriorly and posteriorly, with two hairs; eye prominent, colorless, with bristle; occiput concave; antennal bands broad, faintly colored; mandibles reddish brown; a small black ocular fleck; whole head slightly testaceous, except oval fossae and part between occipital bands.

Prothorax short, sides rounded, without hairs, blackish brown lateral bands, extending around on posterior margin and almost meeting; coxal bands visible; interior of segment same color as head; metathorax larger, pentagonal, posterior margin broadly angulated on abdomen; three hairs at posterior angles; sides convex, widely diverging; black-brown lateral bands curving inward; legs pale with golden tinge at end of tibiae.

Abdomen oval, colorless except faint median blotches on last three segments and sharply defined marginal band strongly piceous to brown, fainter on last two segments; each segment except the first two with two long hairs at outer angle; dorsum with long slender hairs.

Nirmus actophilus Kellogg and Chapman.

Two males from *Aphriza virgata*, San Geronimo Island.

Nirmus complexivus Kellogg and Chapman.

One specimen from *Limosa fedoa*, Playa Maria Bay.

Nirmus ductilis Kellogg and Chapman.

One specimen from *Amphispiza belli*, San Martin Island.

Nirmus maritimus Kellogg and Chapman.

Two specimens from *Ptychoramphus aleuticus*.

Nirmus ochropygus Nitzsch.

Male and female from *Haematopus frazeri*, San Martin Island.

Nirmus felix Giebel.

One specimen from *Larus heermanni*, Todos Santos Island.

Philonanus becki Kellogg.

One female from *Carpodacus amythus*, Guadeloupe Island.

The specimen is a little larger than the type, but agrees in all other respects. The type was taken from *Procellaria tethys*, on Wenman Island of the Galapagos group. Our specimen may be a straggler, though we have no records of *Procellaria* in this collection.

The abdomen of this specimen, and of the type female, is much more distinctly margined than is shown in the original drawing of the species. (The size might make this worthy of varietal name.)

Giebelia mirabilis Kellogg.

Four specimens from *Puffinus opisthomelas*, Natividad Island.

Lipeurus baculus Nitzsch.

One male from *Columbigallina passerina socorroensis*, Socorro Island.

Lipeurus confidens Kellogg.

Three specimens from *Diomedea nigripes*, Magdalena Bay; one from *Diomedea immutabilis* near San Geronimo Island.

Lipeurus concinnus Kellogg and Chapman.

Four specimens from *Oceanodrama macrodactyla*, Guadeloupe Island. One specimen from *Diomedea immutabilis*, near San Geronimo Island.

Lipeurus diversus Kellogg.

Four females from *Oceanodrama macrodactyla*, Guadeloupe Island.

Lipeurus gracilicornis var. *major* Kellogg.

Two females from *Fregata aquila*, San Benedicte Island.

Lipeurus faralloni Kellogg.

Two specimens, too young to identify positively, probably undescribed, from *Haematopus frazeri*, San Martin Island.

Lipeurus fuliginosus Tasch.

Three specimens from *Puffinus opisthomelas*, Natividad Island.

Lipeurus testaceus Tasch.

Two specimens from *Puffinus opisthomelas*, Natividad Island.

Lipeurus limitatus Kellogg.

One female from *Oceanodroma macrodactyla*, Guadeloupe Island.

Eurymetopus taurus Nitzsch.

Two males from *Diomedea nigripes*, Magdalena Bay; one female and one immature specimen from the same albatross species, off Cape San Lucas. Another female bears the host record, *Carpodacus amplus*, Guadeloupe Island, but is evidently a straggler.

Colpocephalum funebre Kellogg.

One specimen from *Larus heermanni*, San Geronimo Island.

Colpocephalum unciferum Kellogg.

One female from *Puffinus auricularis*, Clarion Island.

Colpocephalum sp. juv.

A specimen, too young to be determined, from *Puffinus auricularis*, Clarion Island.

Colpocephalum milleri Kellogg and Kuwana.

Three specimens of this species from *Anous ridgwayi*, Socorro Island, and two from *Sterna anaetheta*, Socorro Island.

Colpocephalum flavescens Nitzsch.

Four specimens from *Speotyto hypogaea*, San Benito Island.

Colpocephalum dominicanum n. sp.

Two males from *Oceanodroma macrodactyla*, Guadeloupe Island. This specimen approaches *spinosum* of Piaget, from *Francolinus capensis*.

Description of male.—Body, length 1.72 mm.; width .60 mm.; strongly brown, concolorous with the exception of abdomen, which has slightly darker transverse blotches; head of unusual and distinctive shape.

Head, length .40 mm.; width .44 mm.; broadly rounded in front, with rather short hairs on the margin; ocular emargination not deep; eye small, convex; temples extended but slightly and moderately rounded, with three very long hairs; posterior angles angularly meeting occipital margin; occipital margin slightly concave; mandibles piceous.

Prothorax twice as broad as long; sides extended, coxae showing through very slightly darker; otherwise without distinct markings; sides with one long hair. Metathorax narrow in front; sides slightly arcuate, diverging; color brown, coxae showing through as darker blotches; dorsum with short, scattered hairs; sides with one long hair; legs short, femora thick, lighter than general body color, and with numerous bristles.

Abdomen elongate; basal segment as broad as apex of thorax; broadest at segments 3 to 5; first segment with one hair at marginal angle; others with two long hairs; dorsum with many scattered long hairs; apical segment with fringe of shorter hairs; color almost uniformly dark brown, the marginal blotches showing slightly darker than the rest of the surface.

Colpocephalum tigrum n. sp.

Three males from *Arctaria melanocephala*, San Martin Island, and two from *Aphriza virgata*, San Geronimo Island. The described species nearest this is *C. trimaculatum* Piaget, but the broad, complete transverse blotches of the metathorax and first abdominal segment at once distinguish that species from *tigrum*.

Description of male.—Body, length, 1.60 mm.; width .64 mm.; color clear with brownish blotches, producing a strikingly and unusually marked *Colpocephalum*.

Head, length .35 mm.; width .42 mm.; front broadly rounded, semi-circular; four short and two medium hairs on the frontal margin, a long hair on lateral margin of front; ocular fringe prominent; eye distinct, with a prominent bristle; temples prominent, with three strong hairs; posterior margin of occiput concave; mandibles dark brown; ocular blotches dark brown, large, about twice as long as base of eye; a small brown blotch on signature; occipital bands light brown, except for darker spots at base and at apex converging; space between occipital bands brown; most of head with faint smoky brown color.

Prothorax about twice as broad as long; sides angulate at anterior third, with short hair at angle; coxae showing through as brown blotches; a shield-shaped brown ventral blotch, and a brown margin, the rest colorless. Metathorax at broadest part as broad as base of abdomen; sides angulate at middle, the angles bearing two bristles; colorless except for brown margin, a shield-shaped ventral blotch, and a short brown longitudinal line at base; coxae showing through as brown blotches; legs short, femora very thick; a faint brown spot on outer edge of femur near base, and a dark brown spot near tip of tibiae; tarsi faintly yellow; legs otherwise uncolored or faintly smoky.

Abdomen elongate oval, broadest at third and fourth segments; the segments of nearly equal length, a stout bristle at the posterior angle of each, each segment except the first with a long stout hair in addition to bristle, a single transverse row of weak hairs on dorsum of each segment except last two; first to sixth segments with a transverse narrow brown dorsal blotch, first to seventh with an irregular, darker marginal blotch, seventh segment with faint dorsal blotch, eighth with four small blotches; last segment with rows of minute hairs; genitalia colorless; except for above blotches abdomen is colorless.

Menopon dissimile Kellogg.

One male from *Pyrrhoxia venusta peninsulac*, San Jose del Cabo.

Menopon infrequens Kellogg.

Three males from *Larus heermanni*, San Geronimo Island.

Menopon paululum Kellogg and Chapman.

One immature male from *Oceanodrama macrodactyla*, Guadeloupe Island.

Menopon singularis Kellogg.

Two males from *Phaethon athereus*, Socorro Island.

Menopon becki Kellogg.

One male from *Phaethon athereus*, Socorro Island.

Physostomum diffusum Kellogg.

One specimen from *Ammodramus sanctorum*, San Benito Island.

Physostomum subhastatum Durrant.

Three specimens from *Pipilio albigula*, San Jose del Cabo.

Physostomum fasciatus Piaget var. *arcuatus* nov. var.

Two specimens from *Tyrannus vociferus*, Cerros Island. The type of the species, taken from *Larus capistratus*, at the Zoological Garden in Amsterdam, was undoubtedly a straggler. Our specimens differ from the species figure and description in having two hairs directly anterior to the eye, the posterior angles of the head with two hairs, the sides of the prothorax with three long hairs, and the sides of the metathorax more arcuate for the posterior two thirds. The signature is piceous, and the front more convex.