

have never once succeeded; it seems to be entirely dependent on itself (possibly emotional), and not arising from any outward cause—nor from the time of day; neither is it regular in its changes. At first, I was a little astonished, and could scarcely believe my own eyes, until I had repeatedly proved the event; the change of colour is always equally the same, extending all over its body.

This lizard is also infested with a tiny red parasite, that sticks on between its scales in the outer angles of the thighs of its hindlegs, where it lives together in little clusters of 12–16. This parasite has a thickish body, rather soft, and is very difficult to remove entire. I suppose it to be an insect of the *Hemiptera* order. I have sent specimens of it to Professor Hutton at Christchurch, and to Mr. Maskell at the Museum, Wellington, for examination, etc.

ART. XV.—*A Description of some newly-discovered New Zealand Insects believed to be new to Science.* By W. COLENSO, F.L.S.

[Read before the Wellington Philosophical Society, 1st October, 1884.]

INSECTA.

Order ORTHOPTERA.

Section GRESSORIA.

Family PHAOMIDÆ.

Division APTEROPHASMINÆ.

Genus *Bacillus*.

1. *Bacillus coloreus*, sp. nov.

Female; General colour light green; the two basal joints of antennæ (under-surface), the throat, and the upper long curved ends of anterior femora bright pink-red.

Head oblong, rather narrow, 8–9 short scattered mucronate points on vertex; occiput broad, width of prothorax; maxillary palpi finely pubescent; antennæ 12 lines long, very slender, cylindrical, pubescent, composed of 22 joints, articulations pink-red, the basal joint large broad and flattish and green on the upper surface, the second basal very small, the rest large, brownish-green with a pink tinge, increasing in size to apex.

Body mostly smooth, $3\frac{1}{2}$ inches long, stout, increasing in size to 3rd abdominal segment where it is $3\frac{1}{2}$ lines wide, a narrow slightly-winged crease or fold with a light-yellow margin extending downwards from anterior legs, giving the appearance of double side margins to the abdomen, which is 19 lines long; a small triangular central dark-brown spot at occiput, another at lower end of pronotum, with a very narrow dark line

connecting them; a similar spot at lower ends of meso- and metanotum, and one at the lower end of every joint (*sternites*) of abdomen, these latter are reddish; prothorax 3 lines long, plain; mesothorax 8 lines long with a few scattered small green points and two larger ones (small spines) on the mesonotum; metathorax 7 lines long and (with mesothorax) broadest at the lower end.

Legs long, rather slender, triangular, striated; striæ pinkish-brown; 2 small spines at lower ends of tibiæ; tarsi very pubescent, tibiæ slightly so, also the anterior femora between spines; ungues large, divergent, glabrous, piceous: anterior pair, femora much shorter than tibiæ, and deeply excised at upper end for more than 2 lines; 5 coloured distant spines on lower outer margin, the upper outer margin sinuate and uneven, with a tubercle on each side under coxæ; coxæ large, stout, brownish, wrinkled: middle and posterior pairs with 4 small brown spines at lower end of femora. Ovipositor large, rounded and slightly pubescent; anal appendages thin at tips pubescent.

The eggs of this insect are peculiar and worthy of a full notice. They somewhat resemble the seeds of a flowering garden-pea; being slightly sub-4-angled in compressed parallelograms 2 lines long and 1 line broad, of a reddish-grey or light chocolate colour, a transverse section being linear-elliptic; their ends truncate with margins produced and rough, one end convex and one end umbonate with a little produced central boss or blunt mucro; the shell is crustaceous, slightly hardish, roughish, and much furrowed irregularly with impressed angular markings rather prettily disposed; one of the lateral edges is smooth, produced a little and thickened, having near the narrower end of the egg a large ovate depression with a raised little seam around it, resembling also the hilum of a leguminous seed: nine eggs weigh two grains.

A female, that I kept alive for some time under glass, laid 54 eggs in a fortnight, in the latter half of June; this she did by merely dropping them, without moving or showing any solicitude. She lived for three weeks, feeding on the bark of the young branches of arbor-vitæ (*Thuja occidentalis*), which she greedily ate, gnawing it off all round very cleanly. The fæces were plentiful and regularly formed in small narrow cylindrical brownish roughish rolls, $1\frac{1}{2}$ lines long, somewhat resembling the withered tips of the branchlets of the shrub on which she lived.

Hab. At Pourerere, E. Coast, near Blackhead, County of Waipawa; 1884: Mr. Wm. Scott.

Obs. I. I have subsequently (two months later) received from Mr. Scott another living specimen of this insect, also a female, and precisely agreeing with the former one received from him. This second specimen, however,

was not pregnant (very likely had laid her eggs before capture), she would not eat and only lived a few days. And again, since writing the foregoing, I have received from him a third specimen, this one being a male; it is smaller and slenderer and more smooth, but agreeing in every other particular.

II. As a species it is apparently allied to *B. hookeri*, but very distinct. In its many and bright colours, the configuration of its head and anterior femora, it approaches species of the allied Australian genus *Phasma* (*Diura*).

2. *Bacillus filiformis*, sp. nov.

Colour fulvous irregularly variegated with brown.

Head dull-grey, sub-triangular, broadest in front, convex at vertex, smooth; eyes very prominent at angles, neck narrow; antennæ setaceous, $1\frac{1}{2}$ inch long, very roughly pubescent, brownish-yellow ringed with 23 black knobbed joints (reminding of a miniature stem of *Dendrobium lessonii*), apical joint longer than each of the three following, and the middle joints longest, with a small whitish protuberance on each horn about the middle.

Body very slender, length 4 inches, breadth 1 line, a little more at joints of abdomen; prothorax very small, 2 lines long, smooth, with a central longitudinal ridge; mesothorax 11 lines long, with several large spines above and below; metathorax 10 lines long, one pair of spines above, four below; spines distant, stout, coarse, black; abdomen knobbed at joints, two spines below first segment, with a small tubercle under each joint on the sides; appendage broadly triangular, tips finely pilose; anal extremities obtuse, thickened.

Legs very slender, striate or sub-angular, pilose; unguis small, pubescent: anterior pair, two small spines at lower end of femora, tibiæ tetragonal, $1\frac{1}{4}$ inch long, much longer than femora: middle pair, with six stout black spines at lower end of femora, and one very small spine on the inner margin at $\frac{1}{4}$ of the length from coxæ, and a small elevated spine on outer margin of tibiæ at $\frac{1}{4}$ of the length from the basal joint: posterior pair with two small spines at the lower end of femora.

Hab. Woods, Seventy-mile Bush, Waipawa County; 1888: W.C.

Obs. A peculiar dry-looking, rigid, slender form. Apparently a scarce species; only one perfect specimen seen.

3. *Bacillus minimus*, sp. nov.

Colour light green. Body smooth, $8\frac{1}{2}$ lines long, $\frac{1}{2}$ line broad. Head 1 line long; antennæ 1 line long, pinkish, finely pubescent, composed of 9 joints, the lowest two light green, basal large flattish, the apical one longest linear-oblong obtuse. Thorax (notum) with a central pinkish longitudinal broad stripe, vanishing at sides; prothorax $\frac{3}{4}$ line long, slightly wrinkled; mesothorax $1\frac{1}{2}$ lines, metathorax $1\frac{1}{4}$ lines, long; prosternum a triangular scale with a rounded apex.

Legs finely striate; two minute spines at the lower end of femora: anterior pair of femora with a long ridge on the upper margin; tarsi and tibiæ finely pubescent; lowest joint of tarsus flat, broad. Abdomen 4 lines long; anal appendages finely pubescent. Weight barely 2 grains.

Hab. On trees and shrubs, Norsewood, Waipawa County; 1884: W.C.

Obs. This interesting, slim, delicate, and fairy-like little creature, is by far the smallest species of the genus known to me; it differs in several respects from its congeners, particularly in its antennæ. It moves very slowly. At first I had supposed it to be merely the larval state of one of the larger species, but its fully developed antennæ, etc., forbid such a supposition.

4. *Bacillus atro-articulus*, sp. nov.

Female: General colour greenish-grey blotched with brown, bearing a slight iridescent hue. Head ochraceous, oblong, 3 lines long, wider than prothorax, genæ gibbous, vertex depressed, a sub-lunate ridge between the eyes, with two small pits (foveolæ) between ridge and base of antennæ; nine large black spines on the occiput, and a single tubercle just above each eye; antennæ slender, pubescent, 10 lines long, composed of eighteen joints, apical one the longest; palpi pubescent. Prothorax 2 lines long, two black spines at lower edge of pronotum; prosternum smooth: mesothorax $7\frac{1}{2}$ lines long, six spines in three pairs on mesosternum, several scattered and one large pair of black ones central on mesonotum, and a regular longitudinal row of five small spines on the pleura extending down to intermediate coxæ: metathorax 8 lines long, two pairs of spines on metasternum and three pairs on metanotum, with a similar row of five small spines on pleura extending to posterior coxæ. Abdomen rather stout, $1\frac{1}{2}$ inches long, mostly smooth, wrinkled longitudinally below; two short blunt spines above on apical end of each segment, decreasing gradually in size downwards; two small tubercles below at apical end of the first segment, the end of the sixth segment has foliaceous sides and one large central spine below, with a thick ridge running from it to the middle of sheath of ovipositor: anal appendages large bearing scattered black hairs. Legs rather short; all having a ridge of double black spines at the apical ends of femora, and two spines at apical ends of tibiæ, and all joints black at their apical ends, but the terminal joints of the tarsi are light glaucous-green; tarsi and ungues are very hairy, the tibiæ and femora slightly so; hairs black:—anterior pair, coxæ with two black spines below; femora 10 lines long with four sharp angles deeply sulcated between, bearing a single row of six large spines on the lower edge, the upper edge sinuous and bearing three minute and distant spines; the upper excised portion 4 lines long with an elevated sharp ridge; tibiæ of equal length, very slender, smooth; the basal joint

of anterior tarsi longer than those of the two posterior pairs: middle and posterior pairs, femora four-angled, narrow above broad and flat below with spines on all four edges; of the middle pair the femora and tibiæ are of equal length, 7 lines long, with an elevated spine on the outer edge of the tibiæ at the upper end: posterior pair, femora and tibiæ also of equal length, 8 lines long.

Hab. Seventy-mile Bush, near Norsewood, County Waipawa; 1888: W.C.

Obs. I may also note that this specimen had lost its anterior left leg, and that a new one was growing to replace it. This new leg is very small and slim, less than 1 inch in total length, but agreeing in all minute particulars with the right one, save that its more salient points were not fully developed. I suspect this loss of limb is a matter of rather common occurrence among the *Bacilli*,—from the great length of their slender legs, their habitat among the green leaves of trees in the exposed windy branchlets, and their known fighting and cannibal propensities. I have already noticed an instance of similar mutilation, in my description of *B. sylvaticus* (Trans. N.Z. Inst., vol. xiv., p. 278).

Section SALTATORIA.

Family LOCUSTIDÆ.

Genus *Deinacrida*.

Deinacrida armiger, sp. nov.

Male: Whole insect smooth and shining and variously coloured.

Head large, oblique, broadly ovate, 1 inch long, rather wider than prothorax, bright dark red-brown, vertex much convex; eyes prominent subpyriform; antennæ setaceous, $3\frac{1}{2}$ inches long, light brown, finely and densely pubescent; a lighter-coloured ridge between eyes and antennæ with a linear oval centre; clypeus black with a narrow white lower margin bearing two dark longitudinal streaks; genæ rugose, protuberant, black; labrum large, emarginate, brown; palpi light tawny, largely clavate, tips sub-globular, whitish, pubescent; mandibles large, black and toothed, sub-rugulose, the left mandible larger and overlapping. Thorax: prothorax 4 lines wide, concave, sub-rugulose, whitish with a slightly reddish tinge, and blackish markings resembling a shield and its two supporters, and with narrow black anterior and posterior margins, side-margins slightly reflexed; mesothorax 2 lines wide, reddish-brown, with two minute black markings and a black dot on each side; metathorax 1 line wide, of a similar colour and two black dots; sternum of thorax, coxæ, and femora below, light fulvous-red. Abdomen thick, convex, compressed, 18 lines long, much arched at second and third segments, light reddish-brown, irrorated, with blackish bands on lower margins of segments, and a reddish-pink hue on the lighter-coloured parts; anal appendages greyish, pubescent. Legs:

posterior pair very stout and long, femur and tibia each about 10 lines; anterior pairs much smaller; anterior and intermediate coxæ armed with a large light-fulvous spine; the upper surface of all femora whitish with a reddish tinge, smooth, each having three longitudinal lines of short dark-brown diagonal streaks on the outer, and two lines on the inner side, but on the posterior pair those two inner rows possess short muricated points, this latter pair is also sulcated on the lower side and black at the lower end, and bears five spines on the outer and six smaller ones on the inner edge, each row gradually increasing in size downwards; posterior tibiæ very stout, dark brown, triangular, four large spines on the outer and five on the inner edge, and five spines together at the lower ends; anterior and intermediate tibiæ 7 lines long, brown, each having five pairs of spines on the lower edge, and two spines on the upper edge at the lower end; a sunken oval depression $1\frac{1}{2}$ lines long, covered with a bluish-grey spotted and thin membrane, on both sides of anterior tibiæ near the upper end: tarsi, brown, hairy; ungues and tibiæ slightly so; pulvilli (or four cushions on sole) remarkably large, hemispherical, glabrous, bluish-grey.

Hab. Wairoa, Hawke's Bay, whence received in spirits; 1884: W.C.

Obs. This is both a peculiar and pretty species, something dapper and taking about it, from its many and bright contrast colours; the dark markings on the light ground of the prothorax are symmetrical and curious, and closely resemble a 6-angled shield with its two supporters! Hence its trivial name. It seems allied to *D.* (or *Hemideina*) *megacephala*, Buller; and possesses characters belonging to those two genera,—if they are really and naturally distinct, which I doubt.

Order NEUROPTERA.

Family MYRMELEONIDÆ.

Genus *Myrmeleon*.

Myrmeleon nova-zealandia, sp. nov.

Body slender, densely pubescent, black above and below, sub-iridescent, with yellowish joints to abdomen, and a broad grey lateral stripe running down each side that is less hairy; extremity of abdomen brown with whitish spots, and a tuft of longish black rigid hairs; abdomen much shorter than wings. Head, vertex and thorax glabrous, with a few longish soft hairs on prosternum and at junctions; piceous-brown above, yellowish and spotted with brown below and at base of antennæ; clypeus large and labrum yellow, with 4–5 dark hairs on the latter; mandibles large piceous; palpi light brown, dark at tips; eyes very large and prominent, metallic-greenish, shining, with innumerable facets; antennæ 3 lines long, diverging, curved, bluish-black, the two basal joints whitish spotted with brown, clavate with a mucro, annulate, about 30–32 rings, with very fine short verticillate hairs;

prothorax small; mesothorax curved upwards and projecting shell-like over prothorax, with a loose space between neck and pronotum, and a larger one between prothorax and mesothorax. Legs hairy, piceous-black, with two large spines (spurs) at lower end of tibiæ; femora yellow above, brown at lower end; ungues long, diverging and bright red-brown. Wings iridescent, brownish, finely ciliate with dark hairs, densely reticulated, cells all shapes and sizes, but more regularly rectangular on sub-median vein, and largest between sub-costal and median veins, pilose with long dark and rather distant hairs on all veins and bands; spotted generally with brownish dots and markings, that are somewhat sub-quadrate at bands and triangular at forks (and sometimes broadly so at bands), outer edges irregular and not defined, the centre of the wings free of spots, also the costal cells from base to stigma: anterior wings (each) $1\frac{1}{2}$ inches long, 5 lines wide, sub-oblong-lanceolate, dimidiate, much contracted at base, obtuse-pointed at tip, apex inclined below; stigma oblong, whitish-yellow (or light cream-colour) with short dark hairs, a large black-brown spot at the basal end, and a brown blotch opposite between sub-costal and median veins, and another blotch directly opposite towards lower margin; costal vein yellow at base and gradually becoming brown; sub-costal vein double for about two-thirds of length of wing—from $\frac{1}{4}$ inch from base on to stigma, and without bands between,—yellow with brown dashes at junction of bands, and on sub-median vein below; ante-cubitals straight, simple; post-cubitals forked and sloping, a few in the centre forming cells: posterior wings each $1\frac{1}{4}$ inches long, 4 lines wide, sub-linear-oblong, more acute, and less and more finely spotted than anterior pair; spots mostly triangular in forks below stigma and about tips; stigma rather large, oblong, whitish; a brown blotch opposite stigma and near the lower margin.

Length of the body 16 lines; of the wings extended 38 lines.

Hab. Seventy-mile Bush, Waipawa County; (rare, like other species of the genus; three specimens only obtained with much difficulty); 1882-83; W.C.

Obs. A very elegant insect, in form, colour, iridescence, and finely hairy and ciliated wings; in this latter respect closely approaching the next sub-order *Trichoptera*. It seems to have some affinity with our only other and little-known New Zealand species of this very large and cosmopolitan genus,—*M. acutus*, Walker, (B.M.),—judging from description only; but it is very distinct.

The larva is ovate, thick, fleshy, largely convex above, 6-7 lines long, 3 lines broad, of a reddish-grey hue, spotted with brown and black. Head 1 line long; mandibles $1\frac{1}{2}$ lines long, curved, hairy, grooved on lower surface, each having three large and stout curved spines on the inner margin;

antennæ very small and slender at base of mandibles. Two large brown spots sub-lateral on metanotum; two smaller ones similarly situated on meso- and pronotum. Abdomen of a lighter colour below, with eight transverse and equal corrugations above, each having five black hairy spots running in regular lines longitudinally. Legs (and mandibles) yellowish-brown, very hairy with spreading black hairs; unguis of posterior pair large, divergent, piceous. Hairs of two kinds: (1) whitish, downy, and appressed; (2) black and bristly, and often in tufts, which are larger at the sides, the largest pair of tufts are marginal just opposite to the posterior legs.

Hab. Hampden, Waipawa County; 1882: Mr. S. W. Hardy.

Obs. This species makes its pitfalls in sandy earth, just like the European species *M. formicarum*. I kept several of these larvæ alive for some time (2-3 months) in light dry soil, they seemed to bear fasting very well. This is a much larger larva than that of *M. acutus* (?), which, I think, I knew, and often watched its habits, at the North, in forming pitfalls, etc., in sandy spots; though I never met with the perfect insect of that species.

Order HYMENOPTERA.

Sub-Order PUPIRORA.

Family ICHNEUMONIDÆ.

Sub-Family Pimplinæ.

Genus *Rhyssa*.

Rhyssa clavula, sp. nov.

Female: Abdomen a rich dark-red-brown variegated with yellow: thorax, antennæ (basal $\frac{2}{3}$), ovipositor and its sheaths much darker brown almost piceous.

Head: orbits of eyes and post-clypeus yellow; two vertical ferruginous lines from base of antennæ to mouth; three ocelli in dark central band a little above the eyes; antennæ filiform, curved, 13 lines long, finely annulate (above 50 joints), and under a lens covered with excessively minute whitish lines, very slightly and finely hairy, basal joints knobbed with yellow margins, the lowest the longest, apical third flavescent, the 3 apical joints light-ferruginous: clypeus dark-margined, enclosing a light-ferruginous triangular spot having a transverse red line, and a shorter brown one above it; labrum dark almost piceous (this dark band also surrounds the mouth); palpi light ferruginous.

Thorax: the mesothorax transversely and finely ruguloso-striate; a large semi-curved triangular yellow spot on pleuræ of prothorax, another below junction of anterior wings, a smaller one above the junction (transversely barred with a narrow dark band), the bases of the wings, the scutellum, post-scutellum, and the apical portion of the metathorax (encircling

the insertion of the abdomen) yellow: wings, iridescent, infumated, hairy at bases, and sparsely sprinkled with very minute hairs; principal veins reddish-brown, cross veins blackish. Legs: all the femora, and the coxæ and tibiæ of posterior pair, very dark ferruginous; the coxæ of the two anterior pairs and all trochanters yellow; all the tarsi, and the tibiæ of the two anterior pairs, light red-ferruginous; a pair of large spines at the apical ends of posterior tibiæ. Abdomen smooth and shining; at the apical ends of the 1st and 2nd segments a broad yellow fascia trifid basally, the extreme apical margins dark-coloured; the 2nd segment has also a lateral linear yellow spot; each of the four following segments has a longitudinal oblong yellow spot in the middle above, and also an elongate yellow one laterally, the lateral ones in the 3rd, 4th, and 5th, occupying nearly the whole length of the segment; the 6th has three yellow lateral spots; and the two following segments have yellow stripes extending to the apical segment, of which the margin is dark-coloured; the minute anal styles at top flavescent; the end of abdomen very thick, largely revolute, and there 5 lines in diameter. Ovipositor setaceous, stiff, slightly curved, $2\frac{1}{2}$ inches long, its two sheaths ciliate and finely serrulate at margins, and coiled up (in spirits); tips sub-linear-spathulate, concave, obtuse, membranous, light-coloured.

Length, direct and plane, 18 lines; or, to extreme end of curvature, 22 lines.

Hab. High and dense forests near Norsewood, Waipawa County; April, 1884: W.C.

Obs. This fine insect is entirely new to me; and from its being so large and so striking I conclude it to be scarce. None of the many residents in that locality had ever seen one before, and were much struck with its size and handsome appearance. For a long time I have been in doubt whether it is not *Rh. fractinervis*, Vollenhoven; which species, in spots and markings, it greatly resembles, and it is only after long and close study of it, and comparing it with the description given of *Rh. fractinervis** that I have believed it to be distinct. Its much larger size, very peculiarly shaped end of abdomen and lateral yellow spots on its second segment, dark colour of its femora and posterior tibiæ, etc., striped clypeus, yellow margins of the basal joints of antennæ, iridescent and hairy and dusky-coloured wings, 3 ocelli, etc., have caused me so to determine.

Genus *Lissonota*.

L. multicolor, sp. nov.

Ferruginous, spotted with yellow and black. Head: orbits of eyes, genæ, a narrow transverse line above labrum, and mentum light yellow;

* "Cat. of Hymenoptera," etc., by Professor Hutton, p. 128; where, however, it is named *Rh. antipodum*, Smith: this name, Professor Hutton informs me in a letter, must yield priority to the other.

a black spot on vertex, a black ring round occiput and neck; antennæ length of body, black; maxillæ and maxillary appendages fulvous. The prothorax yellow anterior edge; mesothorax, a broad black longitudinal line on mesonotum anterior end, with a yellow narrow and longer line on each side, a black lateral line from junction of anterior wing to the yellow line of the prothorax, with narrow black curved lines at lateral edges, small black spots above the junction of wings, and a small dark triangular spot at posterior edge of mesonotum, two small yellow spots beneath the junction of the wings and two larger yellow spots running diagonally towards intermediate coxæ; metathorax, a large triangular black spot on anterior edge of metanotum, with a small yellow transverse bar at its base (post-scutellum), and a large yellow lateral line diagonal towards posterior coxæ, scutellum mottled with yellow, slightly and sparsely acicular at apical end; sternum black; wings iridescent finely hairy and ciliated, hairs black springing from minute tubercles; stigma and nervures brownish; areolet small, subquadrate. Legs ferruginous; coxæ yellow above; tarsi joints barbed and slightly hairy, the last joints of tarsi and ungues dark brown: posterior pair, coxæ black below with a ferruginous line; trochanters black; femora with a fusco-testaceous longitudinal line above: anterior pair, trochanters with a brown line; spurs long on the two posterior pairs. Abdomen ferruginous above, yellow below, a line of fuscous spots at lateral margins of the 3rd on to the 6th segments, a narrow darkish line on the lateral edges of the first three segments, and a light ferruginous one below it on the first four segments; extremity yellow, with a minute black style on each side; ovipositor 4 lines long, light ferruginous at apex, sheaths darker, ciliate. Length of body, $4\frac{1}{2}$ lines.

Hab. Forests at Norsewood, County of Waipawa; 1884; W.C.

ART. XVI.—*Notes on New Zealand Fishes.* By W. ARTHUR, C.E.

[Read before the Otago Institute, 14th October, 1884.]

Plate XIV.

ACANTHOPTERYGII.

Family CIRRHITIDÆ.

Latris lineata, Rich., variety. Pl. xiv., fig. 1.

D. 22/27; P. 16; V. 5; A. 15 remaining; C. $15\frac{1}{4}$; Br. 5; Pyl. c. 4;

Lat. l. 63; trans. l. $\frac{6}{14}$.

A SPECIMEN of this fish, which is rather rare here, was given me by Mr. A. K. Smith, of Prince's Street, Dunedin, having been caught in Otago