DESCRIPTION

OF SOME

SPECIES OF GEOMETRIDÆ

FROM SOUTH AMERICA,

FORMING A NEW GENUS.

BY

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FROM THE
TRANSACTIONS OF THE ENTOMOLOGICAL SOCIETY,
VOL. V.

London

LONDON:
PRINTED BY C. ROWORTH AND SONS, BELL YARD, TEMPLE BAR.

1848.

XXVIII. *Description of some Species of* Geometridæ *from South America, forming a new Genus. By* Edward Doubleday, Esq. F.L.S., F.Z.S., &c.

[Read May 1st, 1848.]

The beautiful insects forming the genus I am about to characterize are natives of the mountainous regions of the tropical portions of South America. The only specimens I have seen of the species here described were brought home by Mr. Dyson from Venezuela, and by Mr. Bridges from Bolivia. The former traveller found the three first species in the lofty mountains of Caraccas, the latter collected the fourth and fifth species in the country of the Yurucam Indians, in the Andes of Bolivia. I have also seen one species from the mountainous parts of Brazil, and much regret not being able to lay before the Society a description of it. It belongs to the third section. Of the affinities of the genus I can say nothing. We know too little of the *Geometridæ* to venture upon that subject, yet perhaps I might safely suggest an alliance to the genera *Odezia*, *Torula* and *Psodos*, all more or less mountain genera. The analogy in form to some of the *Erycinidæ* cannot be overlooked.

Like the genera *Odezia*, *Torula* and *Psodos*, the *Erateinæ* are diurnal insects.

The first segment of the abdomen offers the same remarkable cavity which, on a former occasion, I mentioned to this Society as occurring in some of the *Glaucopidæ*, considering it to be analogous

to the drum of the *Cicadæ*. I regret exceedingly not being able to make out more satisfactorily both this peculiarity, and the structure of certain anal appendages, which seem to exist in both sexes of some at least of the species. In *Erateina Zoraida* those of the male consist of two large shell-like valves, lined internally with hair, and furnished above with a tuft of long hairs on each side; they appear to be capable of being entirely retracted within the abdomen. The structure of the scales and hairs, within the fold of the inner margin of the posterior wings, is very remarkable. The scales are oval, much like those of the peculiar spots on the wings of some species of *Colias* and *Callidryas*, very faintly striate. The hairs are jointed, composed of striated cylinders, much resembling the spines of an *Echinus*, easily detached one from the other, and then appearing like small cylindrical scales. On this subject I shall have more to say at a future time, as also on the characters of the abdomen.

Genus Erateina.

Head small, round, the forehead clothed with appressed scales, the vertex between the antennæ with a tuft of elongate scales, not closely appressed. *Eyes* rather small, round, not remarkably prominent. *Maxillæ* about equal in length to the whole body. *Labial palpi* small, much curved, ascending, parallel, scaly; the scales in front at the base elongate, more or less erect; behind and towards the apex in front short, appressed; first joint stout, sub-cylindric, much curved, the apex obliquely truncate; second joint of about equal length, slenderer, less curved, sub-cylindric, smaller towards the apex; third joint one-third the length of the second, obovate, and slightly pointed. *Antennæ* not quite so long as the body, simple, the joints short, scaly on the back, thickly set at the sides and within with very delicate, short, erect hairs. Thorax rather small, oval, the prothorax exceedingly short. *Anterior wings* trigonate, the apex very slightly rounded, the margins but little rounded, the anterior one-half longer than the inner margin, this latter rather shorter than the outer margin. Costal nervure extending beyond the middle of the anterior margin. Sub-costal nervure throwing off its first nervule before the end of the cell, then bending downwards, and again rising to unite for a short distance with its first nervule, thus forming a small elongate cellule. Second, third and fourth sub-costal nervules united at their origin, the second separating itself at a point nearer to their common origin than the point where the third and fourth separate from each other; the fourth terminating at the apex; the fifth, on

the outer margin, considerably below the apex. Cell less than half the length of the wing. Upper disco-cellular nervule wanting; the first discoidal nervule, arising from the sub-costal nervure, near the end of the cellule formed by its junction with the first sub-costal nervule. Middle disco-cellular nervule arising before the origin of the first discoidal nervule, straight, shorter than the lower disco-cellular, which is first directed immediately across the wing, then outwards to the third median nervule, which makes a slight angle at the point of union. First median nervule thrown off at a point about half as distant from the end of the cell as from the base of the wing, slightly curved downwards, as is the second. Third median nervule slight, curved upwards. *Posterior wings* elongate, caudate, dentate externally; or somewhat quadrate, caudate or rounded; the inner margin in the males (of some species at least) folded back upon the under surface of the wing, forming a semi-oval lobe, the inside of which is lined with scales or jointed hairs of a very singular structure. Precostal nervure extending beyond the margin of the wing, in the form of a short, stout bristle, simple in the males, divided at the termination in the females, not received in either sex into a socket on the under surface of the upper wings. Costal nervure separating from the sub-costal at the base of the wing, then uniting to it for some distance, so as to form a small triangular cellule, again separating from it, and terminating beyond the middle of the inner margin. First sub-costal nervule terminating at the outer angle of the wing. Discoidal nervure thrown off from the sub-costal nervure at right angles to it, a little above its division into its two nervules, then bent at a right angle, and directed towards the outer margin of the wing, slightly bent where the short lower disco-cellular is united to it. Third median nervule slightly bent at the point where it receives the lower disco-cellular. *Anterior feet*, with the femur, nearly twice as long as the tibia, slightly dilated in the middle. Tibia short, armed within, about the middle, with a stout slightly curved spine, extending to the apex or nearly so, and covered in the males (of some species at least) by a tuft of long curled hairs. Tarsi with all the joints sub-cylindric, spiny laterally and below, except the fifth, which is bare below; the first joint longer than the rest combined, second about one-third the length of the first, third about half the length of the second, fourth and fifth nearly equal, rather more than two-thirds the length of the third. Claws curved, serrate internally about the middle, the base covered with a tuft of stiff hairs. Paronychia sub-ovate, fringed with long hairs. Pulvillus broad, not so long as the claw. *Middle and posterior*

legs with the femora rather shorter than the tibiæ, the latter slender, sub-cylindric, rather stouter at the apex than at the base, armed within, beyond the middle, with two moderately stout moveable spines, and two similar ones at the apex. Tarsi longer than the tibiæ, similar in their structure to those of the anterior pair. ABDOMEN short, slender, curved, the base with a cavity on each side, within which may be seen a drum-like membrane. Last segment, in the males at least, furnished with two broad valves, lined inside with hair, and surmounted by a tuft of long hairs on each side.

The genus is divisible into three sections founded on the characters of the posterior wings. In the first section they are elongate, caudate, externally dentate, the tail being formed by a prolongation of the first and second median nervules, reminding us of the hind wings of *Diorhina Rhetus* and its allies.

This section seems to be confined to the more northern parts of South America, as I have only seen the specimens collected by Mr. Dyson.

The second section has the posterior wings subquadrate, the second and third median nervules being prolonged so as to give an angular character to the outer margin. This structure reminds us of the genus *Ancyluris*.

The third section has the posterior wings obovate, and in some respects reminds us of *Eurygona Ouranus*.

The generic details, which will be given conjointly with some figures illustrative of the peculiar scales and hairs of the posterior wings, are from a specimen of *Erateina Zoraida*, the only species I have had an opportunity of dissecting. I may here express my hope that Lepidopterologists will for the future be more careful to preserve the legs of their specimens. In drawing up the generic characters given above I have had considerable trouble owing to want of care in this respect on the part of the collectors of the specimens.

Sect. 1.

Sp. 1. *Er. Zoraida.*

Er. Alis omnibus supra cervino-fuscis, anticis linea media flexuosa, transversa, alba, posticis fascia lata margineque externo cinnabarinis.

Exp. alar. 1 unc. 7 lin. vel 40 mill.

Hab. Venezuela. (Tab. XII. fig. 1, 1 *a*, 2.)

Head black; the orbits of the eyes white, the palpi striped with white; antennæ black; thorax fawn-coloured. Anterior and

posterior wings above of a fuscous brown, more or less tinged with fawn colour, especially towards the base of the wings, the colour varying with the direction of the light. The anterior wings are crossed about the middle by a flexuous white band, commencing below the subcostal nervure, and terminating slightly before the anal angle. The posterior wings are crossed by a submarginal band of a dull cinnabar colour, narrow, almost pointed at its commencement near the outer angle, broad at its termination on the inner margin above the anal angle; sending off two short branches to the outer margin. Outer margin cinnabar-coloured. The under surface of the anterior wings has the base of a dull cinnabar colour, striped longitudinally with white, the cell is crossed by a slightly silvery white band, and the discocellular nervule is marked by a short band of the same colour; the band of the upper surface is represented by a similiar band, extending however to the costa, and to the inner margin, of a paler colour at both its origin and termination, than on the disc; and bordered externally with black. Between this band and the outer margin is a pale ash-coloured line bordered externally with black, the inner margin towards the base is broadly silvery ash-coloured. Posterior wings of the male having the inner margin reflexed at the base, forming a semioval fold, partially covering the disc of the wing; this fold externally is of a cinnabar brown, delicately edged with silvery white, marked near the base with silvery spots, and within its margin by a delicate silvery white line; internally it is lined with silky hairs. Immediately beyond this fold the wing is of a dull cinnabar colour; marked irregularly with white, beyond which are two transverse bands, the first of an ashy white, the second of a cinnabar colour, beyond these bands the wings are of a cinnabar brown clouded, with the outer margin marked with dull white spots, and the outer angle with a dash of the same colour. The female differs from the male in wanting the fold, and having the base streaked alternately with cinnabar and whitish. Legs ash-coloured. Abdomen fawn-coloured, ringed with white.

Sp. 2. *Er. Ianthe.*

Er. Alis anticis cervinis, costæ basi cinnabarina, posticis basi subcinnabarinis, tunc rufo-aurantiacis, fascia submarginali externe dentata nigra.

Exp. alar. 1 unc. 7 lin. vel 40 mill.

Hab. Venezuela. (Tab. XII. fig. 3, 4.)

Head black, orbits of the eyes white. Palpi striped with white. Antennæ black. Thorax greyish fawn-coloured. Anterior wings

above fawn-coloured, the base of the costa and the median nervule cinnabar-coloured. Posterior wings cinnabar-coloured at the base, the inner margin and the base furnished with some long fawn-coloured hairs, the middle crossed by a broad band of a reddish orange, narrowed near the costa; beyond this is a broad, black, submarginal band, reaching from the outer to the inner angle, sending out two short branches to the outer margin, and a broad one to the tail; the outer margin cinnabar-coloured, inner margin marked with a round black dot at the anal angle. The under surface of the anterior wings is white at the base, marked with three or four cinnabar-coloured vittæ. The costa is yellowish; the disc is crossed by a cinnabar-coloured band, becoming narrower towards the inner margin, marked at the end of the cell with a short white vitta; this band is followed by a white one, extending from the costa to the anal angle; beyond this band the wings are of a cinnabar brown, freckled with ashy white, and crossed by a band of the same colour. The posterior wings have the under surface white from the base beyond the middle, more or less marked with narrow cinnabar-coloured lines, then follows a rufous orange band, bordered externally near the outer angle with greyish ash colour, and beyond this with black; the remainder of the wings is of a deep cinnabar hue, the outer margin with three white lunules, separated by two black dots; the tip and inner side of the tail each with a white dot, separated by a black one, another white spot at the termination of the orange band, and above this a black one. Legs greyish. Abdomen ash-coloured, ringed with white.

This species is easily known from the preceding by the want of the flexuous white band of the anterior, and the cinnabar-coloured base of the posterior wing. The specimen figured Tab. XII. fig. 4, I have considered only a variety of this species, but it possibly is distinct from it. Above it has two slight transverse reddish bands, beyond the middle of the anterior wings, which approximate as they approach the anal angle, less red on the median nervure, and a slight tinge of red on the sub-median; the posterior wings have a black dash on the anterior margin, and more black at the anal angle than in the true *Er. Ianthe.* Below, the base of both wings is more distinctly marked with cinnabar-brown vittæ. If distinct, I propose for it the name of *Er. Iphis.*

Sp. 3. *Er. Julia.*

Er. Alis anticis fuscis, basi cervinis, fascia transversa media,

alba, hyalina; posticis luteis, basi cervinis, fascia lata externe dentata, submarginali nigra.

Exp. alar. 1 unc. 9 lin. vel 45 millim.

Hab. Venezuela. (Tab. XII. fig. 5, 5*a*.)

Head white, the forehead with two black lines uniting on the vertex. Palpi white, lined with black. Antennæ black externally, white internally. Thorax greyish ash or fawn-coloured, with four black longitudinal lines, the prothorax white. Anterior wings fuscous above, the base fawn-coloured, the disc crossed by a semi-transparent whitish band, commencing on the costa beyond the cell, and terminating almost in a point a little above the anal angle. Posterior wings above bright luteous, the base fawn-coloured, the outer margin with a rather broad black band, commencing on the costa, occupying the outer angle, and terminating at the anal angle, sending off a branch which terminates before the end of the tail, and having two short teeth extending to the outer margin. The inner margin has two dark spots about the middle; the outer margin is bright luteous, except where touched by the black of the submarginal band. The anterior wings have the lower surface yellowish white at the base, with five longitudinal cinnabar-coloured vittæ, the inner margin pale fuscous, the rest of the wing of a cinnabar hue crossed by two bands; the first the white sub-diaphanous band, common to both surfaces, the second nearer to the outer margin, narrower, pale ash colour. Cilia fuscous. The posterior wings have the lower surface streaked at the base with yellowish white, the middle crossed by a whitish band, tinged with yellow, bordered with luteous yellow beyond the second sub-costal nervule, bent almost at a right angle where it crosses the first median nervule, terminating on the inner margin above a rounded black dot; near the outer angle is an abbreviated, slender, pale fascia, terminating before reaching the discoidal nervule, beyond which are two or three small black clouds; the outer margin is marked with two black spots, and there are two similar spots, one at the anal angle, one on the inner side of the tail. Legs greyish. Abdomen ringed alternately with pale greyish and fawn-coloured.

I have named this beautiful insect after the wife of one of the most amiable and talented of French Entomologists. Those who have read the *Lettres à Julie* will agree with me in the opinion that there does not exist a better elementary work on Entomology, and certainly none in which science is so delightfully intermingled with love and poetry; and those who, like myself, have been ho-

noured by the friendship of their author will know how to appreciate the candour, the kindness, and the unaffected simplicity so conspicuous in his writings.

Sect. 2.

Sp. 4. *Er. Neæra.*

Er. Alis omnibus supra nigris, basi cervino-tinctis, anticis vitta basali alba, fascia pone medium transversa, abbreviata diaphana, lineis duabus submarginalibus ochraceis; posticis vitta media, maculisque marginalibus albis.

Exp. alar. 1 unc. 6 lin. vel 38 millim.

Hab. Bolivia. (Tab. XII. fig. 6.)

Head black, orbits of the eyes white, antennæ black. Thorax fawn-coloured. Anterior wings above fuscous black, the base fawn-coloured, with a white dash below the median nervure, the disc with an abbreviated and transparent fascia; beyond which, near the costa, is a comma-shaped ochreous dot, from which proceed two slender lines of the same colour, reaching about to the first median nervule. Posterior wings above with a rather broad white vitta, occupying the disc, and four white spots on the outer margin. The under surface of both the anterior and posterior wings is cinnabar-coloured, the base streaked with white, the two ochreous lines of the anterior wings replaced by a band of that colour, divided by an ash-coloured line. The posterior wings have several discoidal, lunate white spots, and towards the margin a flexuous, ochre-coloured band, divided by a grey line. Legs ash-coloured. Abdomen fawn-coloured, ringed with white.

Sect. 3.

Sp. 5. *Er. Cynthia.*

Er. Alis omnibus supra fuscis, anticis macula disci diaphana; posticis disco maculisque marginalibus albis.

Exp. alar. 1 unc. 1 lin. vel 26 millim.

Hab. Bolivia. (Tab. XII. fig. 7, 7*a*.)

Head black, orbits of the eyes white, antennæ black. Thorax black. Anterior wings above fuscous black, with a large diaphanous spot beyond the cell, divided by the discoidal and third median nervules. Posterior wings fuscous black, the whole disc occupied by a large white patch; the cilia black, spotted with white. The lower surface of the anterior wings is varied with cinnabar and ochre-colour, the former colour predominating on

the costa and outer margin. The posterior wings of the males have the inner margin reflexed, forming a semi-oval lobe, the exterior surface of which is of a silvery white, the wings beyond this lobe silvery white, with a small cinnabar spot opposite the middle of the fold; the outer margin broadly cinnabar-coloured, clouded with yellowish, the cilia spotted with white. Legs fuscous, the tibiæ and tarsi ringed with white. Abdomen black, with white rings.

EXPLANATION OF PLATE XII.

Fig. 1. *Erateina Zoraida*, ♂.
1*a*. ,, ,, ,, under surface.
2. *Erateina Zoraida*, ♀.
3. *Erateina Ianthe*.
4. *Erateina Ianthe*, Var.? (*Er. Iphis*.)
5. *Erateina Julia*.
5*a*. ,, ,, under surface.
6. *Erateina Neæra*. The base of the anterior wings is coloured rather too dark. The specimen has been considerably rubbed by the captor, but appears to have had rather more of the fawn colour than the artist has represented.
7. *Erateina Cynthia*, ♂.
7*a*. ,, ,, ,, under surface.

The generic details will be given on a future plate, with the figures of the scales and hair of the posterior wings, of which I hope soon to have a notice before the Society.