

PSYCHE.

THE ORTHOPTERAN GENUS TRIMEROTROPIS.

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I have recently finished a revision of *Trimerotropis* Stål and as its publication is likely to be somewhat delayed it has been thought best to publish the key with brief notes on the most important synonymy and the localities of the species. Through the kindness of the National Museum, Dr. Scudder and Dr. Bruner I have been able to study the types or typical specimens of all the species described in this country

except only *Tr. thalassica*. The type of this species should be in the National Museum but I have not been able to find it there. I have not been able to examine Saussure's types but with a few exceptions I have satisfactorily determined his species. The genus is one of the largest and most difficult of Orthoptera but with a single exception it contains species of little economic importance.

KEY TO TRIMEROTROPIS.

*A*¹. Tegmina plain isabelline, not banded and with spots not segregated into groups extending across the wing. Frontal costa* sulcate as strongly above as below the ocellus, its carinae continuous with the carinae of the vertex. Pronotum with the disk flat. Area of the cubital forks narrow and with few exceptions occupied wholly or in part by a single row of quadrate cells. Wings always long with the disk greenish yellow or hyaline throughout. Posterior tibiae never blue. AGONIZOA subg. n.

*a*¹. Lateral lobes of the pronotum with a dentation on the posterior part of the lower border.

*b*¹. General color pale testaceous, very plain. Wings transparent without a trace of a fuscous band. Tegmina without bands and with a very few spots restricted almost entirely to the middle field. Posterior femora light on the

* *Tr. coquilletti* has the frontal costa mostly solid above the ocellus.

inner face with the usual black bands obsolete. HYALINA GROUP.

Hyalina n. sp.

*b*². General color isabelline. Wings with a definite fuscous band or at least with plain indications of such a band in the infuscated nerves of the region usually occupied by the band. Pronotum with a definite stripe extending along the sides of the disk or at least with the edges lighter than the middle.

TEXANA GROUP.

*c*¹. Prozone of the pronotum bilobate when seen from the side. Median carina a raised line on the metazone.

*d*¹. Process of the metazone acutangulate. Metazone twice as long as the prozone. Fuscous band of the wings broad. Posterior tibiae dull orange. *Texana* Brun.

*d*². Process of the metazone obtusangulate. Metazone not more than one and three quarter times as long as the prozone. Posterior tibiae obscure greenish.

*e*¹. Smaller, ♂ 15 mm., ♀ 22 mm. long. Crest of the prozone divided into dentiform lobes. *Rebellis* Sauss.

*e*². Larger, ♂ 19-23 mm., ♀ 27-30 mm. long. Crest of the prozone divided into rounded lobes.

*f*¹. Posterior lobe of the crest of the prozone plainly not so high as it is long. Posterior femora very distinctly banded on the outer face, lower sulcus light colored with two black bands.

Albolineata Brun.

*f*². Posterior lobe of the crest of the prozone as high as it is long. Posterior femora indistinctly banded on the outside, lower sulcus black with two light bands. *Cristata* n. sp.

*c*². Prozone of the pronotum not bilobate when seen from the side, and barely intersected by the sulcus and therefore straight and barely perceptibly notched. Median carina cristate on the metazone and nearly as high as on the prozone. *Porrecta* n. sp.

*a*². Lateral lobes with no dentation on the posterior part of the lower border, or if there is a blunt tooth present, the fuscous band is weak or interrupted and the pronotum has no definite stripe along the lateral edges of the disk nor is the middle darker than the lateral borders. MARITIMA GROUP.

*b*¹. Area of the cubital forks of the tegmina occupied by more than one row of irregular cells.

*c*¹. Wings with the median and cubital areas about equal. Larger, ♂ 26 mm., ♀ 34 mm. long. North American. *Maritima* Harr.

*c*². Wings with the median and cubital areas very unequal. Smaller, ♂ 22 mm., ♀ 28 mm. long. Chilean *Ochraceipennis* Blanch.

b^2 . Area of the cubital forks of the tegmina narrow, occupied by a single row of subquadrate cells. Lower sulcus of the posterior femora black with a single preapical light band.

c^1 . Median carina of the metazone somewhat cristate. Fuscous band of the wings indicated only by infuscated veins or at most incomplete and continued on the posterior margin less than half way to the anal angle, spur extending more than half way to the base. *Gracilis* Thos.

c^2 . Median carina of the metazone distinct but merely a raised line. Fuscous band of the wings distinct and uninterrupted, continued on the posterior border much more than half way to the anal angle, spur extending less than half way to the base. *Coquilletti* n. sp.

A^2 . Tegmina fasciate, with solid well defined bands reaching at least half way across the wing from the anterior margin, or by the segregation of annular spots, fasciae sometimes faint on account of the slight contrast between them and the ground color. Rarely the tegmina are not fasciate, then they are evenly maculate with fuscous annuli and the wings are broad with the apical half fuscous or fuliginous. Frontal costa generally sulcate above the ocellus for a short distance only, below the vertex rounded and punctate. Pronotum with the disk usually elevated and subtectiform on the prozone. Area of the cubital forks broad, occupied by several rows of irregular cells TRIMEROTROPIS subgenus.

a^1 . Wings with the disk yellow or green, never blue and never without a fuscous band or cloud.

b^1 . Hind tibiae never blue. Tegmina with the basal and median bands solid, approximately equal to each other and to the light bands just beyond with which they alternate, and confined to a little more than the anterior half CINCTA GROUP.

c^1 . Front of the head with two black bands extending between the eyes, one above and one below the basal joint of the antennae. *Cincta* Thos.

c^2 . Front of the head with no black bands extending between the eyes *Juliana* Scudd.

b^2 . Hind tibiae frequently blue. Tegmina not as in the alternative.

c^1 . Tegmina * fasciate through the uneven distribution of maculations or by well-defined clouds or bands. If the tegmina are the first kind then the outer half of the wing is not infuscated and the lower sulcus of the hind femora are black with a single preapical light-band.

d^1 . Posterior tibiae blue COERULEIPES GROUP.

e^1 . Lateral lobes of the pronotum with the posterior angle rounded,

* *Tr. agrestis* with a broad fuscous band and red hind tibiae must be included here though the tegmina are almost destitute of spots.

without a downward projecting tooth. Disk of the wings greenish or yellow.

*f*¹. Lower sulcus of the posterior femora black with a single pre-apical light band.

*g*¹. Wings with the apical half hyaline, neither fuscous nor fuliginous except at the extreme tip. Bands of the tegmina plainly formed by the aggregation of smaller maculations.

Caeruleipes Scudd.

*g*². Wings with the apical half fuliginous and fuscous, nowhere entirely hyaline. Basal and median bands solid and well-defined at least on the anterior half.

*h*¹. General color light, punctate with fuscous. Tegmina conspicuously fasciate and punctate with fuscous. Disk of the wings semiopaque, yellowish green, beyond mostly fuscous.

Tessellata n. sp.

*h*². General color fuscous, nearly plain. Tegmina plain fuscous with two pale bands. Wings with the disk transparent greenish yellow, beyond mostly fuliginous. *Caliginosa* n. sp.

*f*². Lower sulcus black with two light bands on the apical half, or (through the fading of the fuscous base) light with one preapical black band.

*g*¹. Ground color white. Tegmina white with three narrow black bands. Scutellum of the vertex very shallow with a very indistinct median carina

Albescens n. sp.

*g*². Ground color brown or gray never white and with only the basal and median bands well defined.

*h*¹. Scutellum of the vertex with a median carina. Posterior field of the tegmina not plain, with spots or fascia.

*i*¹. Bands of the tegmina not weakening posteriorly, in the posterior field not broken up into spots. Scutellum of the vertex no longer than broad even in the male.

Bifasciata Brun.

*i*². Bands of the tegmina weakening posteriorly, in the posterior field broken up into spots. Scutellum of the vertex much (♂) or a little (♀) longer than broad.

Ferruginea n. sp.

*h*². Scutellum of the vertex deeply sulcate with no median carina. Posterior field plain without spots or fascia.

Koebelii Brun.

*e*². Lateral lobes of the pronotum with the posterior angle furnished

with a minute downward projecting tooth. Disk of the wings sea-green *Thalassica* Brun.

*d*². Posterior tibiae red or orange.

*e*¹. Lateral lobes of the pronotum without a tooth on the posterior part of the lower border.

*f*¹. Scutellum of the vertex moderately broad but plainly less than the short (♂) or long (♀) diameter of the eye. Posterior femora with the disk of the inner face yellow or red with three black bands, one apical, one preapical and one median, the latter may extend, as a stripe, toward the base, but the immediate base is very rarely black, rarely the whole inner face may be suffused with fuliginous, obscuring the markings. CITRINA GROUP.

*g*¹. Disk of the metazone of the pronotum plainly lighter than the prozone, generally reddish brown in color and smooth except for a few large scattered generally black granules. Posterior femora chiefly red on the inner side.

*h*¹. Lower sulcus as well as the inner face chiefly red with no fuliginous suffusion obscuring the fuscous bands or spots.

Monticola Sauss.

*h*². Lower sulcus of the posterior femora black or fuliginous. Median carina slight but distinct. *Campestris* Brun. Ms.

*g*². Disk of the metazone not as in the alternative.

*h*¹. Median and basal bands of the tegmina solid and not plainly formed by the grouping of spots.

*i*¹. Bands of the tegmina conspicuous.

*j*¹. Process of the metazone acute.

*k*¹. Median carina of the scutellum of the vertex distinct *Bruneri* n. sp.

*k*². Median carina wanting. *Fascicula* n. sp.

*j*². Process of the metazone decidedly obtuse.

Praeclara n. sp.

*i*². Bands of the tegmina dim, color testaceous, plain. Metazone with its process acute. *Modesta* Brun.

*h*². Median and basal bands of the tegmina obviously made up of fuscous annuli. Process of the metazone obtuse.

Citrina Scudd.

*f*². Scutellum of the vertex equalling the short (♂) or long (♀) diameter of the eye. Posterior femora with the disk of the inner face black with one or two light bands on the apical half. Fuscous band of the wings at least one fourth the length of the wings in width. LATIFASCIATA GROUP.

*g*¹. Posterior femora with two light bands on the inner face. Process of the metazone obtusangulate with the tip rounded.

*h*¹. Median carina of the scutellum of the vertex wanting. Median carina of the metazone of the pronotum elevated and very distinct *Latifasciata* Scudd.

*h*². Median carina of the scutellum of the vertex distinct. Median carina of the pronotum nearly obsolete on the metazone *Laticincta* Sauss.

*g*². Posterior femora with one light band on the inner face. Process of the metazone of the pronotum acutangulate with the tip sharp.

*h*¹. Basal half of the wings yellow.

*i*¹. Outer half of the wings infuscated. *Tolteca* Sauss.

*i*². Outer half of the wings not wholly infuscated but the apical hyaline part nearly as broad as the fuscous band.

Pistrinaria Sauss.

*h*². Basal one sixth of the wings yellow, apical one sixth hyaline, remaining two-thirds occupied by the fuscous band.

Melanoptera n. sp.

*e*². Lateral lobes of the pronotum with a tooth on the posterior part of the lower border. CALIFORNICA GROUP.

*f*¹. Tegmina conspicuously banded or at least with the fuscous punctations well separated into three groups.

*g*¹. Pronotum with a light stripe on either side of the disk. Fuscous band of the wings narrow, about one seventh of the length of the wing in width. *Californica* Brun.

*g*². Pronotum quite plain on the disk. Fuscous band of the wings broader, one sixth or one fifth the length of the wing in width.

*h*¹. Metazone of the pronotum twice as long as the prozone, with the process acutangulate. *Strenua* n. sp.

*h*². Metazone of the pronotum once and a half as long as the pronotum with the process obtusangulate

Montana Brun. Ms.

*f*². Tegmina with scarcely a trace of the usual bands, but with a few scattered spots on the basal half, the rest almost plain.

Agrestis n. sp.

*d*³. Posterior tibiae yellow green or brown.

*e*¹. Lateral lobes of the pronotum with a tooth on the posterior part of the lower margin. PACIFICA GROUP. *Pacifica* Brun.

*e*². Lateral lobes of the pronotum without a tooth. Tegmina distinctly or conspicuously banded except sometimes in dark colored specimens, where the contrast may be slight; fascia large and though irregular in shape semisolid and something more than aggregations of fuscous spots. Wings yellow or greenish yellow at the base with a distinct fuscous band. Posterior femora with the disk of the inner face black with two light bands. VINCULATA GROUP.

*f*¹. Lower sulcus of the posterior femora light with one preapical black band or black with two light bands, one preapical and one median, the latter not merely interrupting the black on the edges of the sulcus but in the bottom as well.

*g*¹. Fuscous band in its usual position in the middle of the wing. Spur extending less than half way to the base. General color dark fuscous brown permitting little contrast in the bands of the tegmina.

*h*¹. Metazone scarcely more than one and a half times as long as the prozone. Fuscous band of the wings very broad occupying nearly one third the length of the wings. *Salina* Brun. Ms.

*h*². Metazone twice as long as the prozone. Fuscous band rather narrow, occupying no more than a sixth or seventh the length of the wings. *Similis* Scudd.

*g*². Fuscous band entirely beyond the middle of the wing, making the length of the disk equal to the width, fuscous spur extending more than half way to the base. Bands of the tegmina contrasting strongly with ground color and very conspicuous.

Pallidipennis Burm.

*f*². Lower sulcus of the posterior femora black with one preapical light band.

*g*¹. Posterior tibiae yellow or greenish, never brown.

*h*¹. Pronotum unusually short not (♀) or a very little (♂) longer than wide. Size small, less than 20 mm. (♂) or about 25 mm. (♀). *Collaris* n. sp.

*h*². Pronotum not unusually short, considerably longer than wide even in the female.

*i*¹. Fuscous band very narrow and interrupted, spur acute extending more than half way to the base. Process of the metazone acute. Size small, 20 mm. (♂), 25 mm. (♀).

Fratercula n. sp.

*i*². Fuscous band broad or when narrow distinct and uninterrupted.

- j*¹. Metazone twice as long as the prozone with the process acute. Wings long, barely less than twice as long as wide. Fuscous band narrower, at most not exceeding one sixth the length of the wing. Lower sulcus of the posterior femora with the black not almost severed by the median light band *Vinculata* Scudd.
- j*². Metazone less than one and three quarter times as long as the prozone, with the process rectangular. Wings shorter, being considerably less than twice as long as wide. Fuscous band equal in width to a fourth or a fifth the length of the wing. Lower sulcus of the posterior femora with the black almost severed by the median light band *Saxatilis* n. sp.
- g*². Posterior tibiae brown with a pale subbasal annulus. Size small. Wing very broad, less than one and one half times as long as broad *Pilosa* n. sp.
- c*². Tegmina thickly punctate with evenly scattered fuscous annuli, contrasting little with the fuscous background and not or very rarely collected into groups forming bands. Wings broad with the outer half infuscated or fuliginous, rarely only the tip of the apical part and the veins beyond the fuscous band are infuscated. FALLAX GROUP.
- d*¹. Posterior tibiae blue with a light sub-basal annulus or at least a brownish spot on the exterior face.
- e*¹. Tegmina evenly maculate with at the most faint traces of bands. Process of the metazone acutangulate at least in the male. *Fallax* Sauss.
- e*². Tegmina plainly fasciate by the unequal distribution of fuscous annuli. Process of the metazone obtusangulate even in the male. *Nubila* n. sp.
- d*². Posterior tibiae not blue and without a pale sub-basal annulus.
- e*¹. Portion of the wing beyond the fuscous band either fuscous or fuliginous, spur reaching half way to the base. *Conspersa* n. sp.
- e*². Portion of the wing beyond the fuscous band hyaline, spur reaching two thirds the distance to the base. *Variegata* n. sp.
- a*². Wings entirely hyaline without fuscous band and colored disk or the latter blue with the fuscous band distinct or indicated by infuscated nerves and cells. Fascia of the tegmina never solid but obviously made up of fuscous annuli often imperfectly segregated.
- b*¹. Fuscous band present. Disk blue. Posterior tibiae blue with a light sub-basal annulus CAERULEIPENNIS GROUP.

*c*¹. Prozone of the pronotum strongly elevated and bilobate. Disk of the wings faintly tinged with blue. Fuscous band narrow and indistinct.

Caeruleipennis Brun.

*c*². Prozone of the pronotum very little elevated and scarcely bilobate. Disk of the wings deep blue. Fuscous band broad and distinct.

Cyaneipennis Brun.

*δ*². Fuscous band wanting. The wing entirely hyaline. Posterior tibiae obscure greenish or brown. Posterior femora with the disk of the inner face black with two light bands on the apical half. Lower sulcus light with one preapical black band. AZURESCENS GROUP.

*c*¹. Scutellum of the vertex broad, scarcely longer than broad and about equal in width to the diameter of the eye as seen from above. Process of the metazone acute *Azurescens* Brun.

*c*². Scutellum of the vertex narrow, plainly longer than broad and much less than equal in width to the diameter of the eye as seen from above.

*d*¹. Process of the metazone rounded. Basal fuscous band distinct from the fuscous points of the immediate base. Larger, male more than 20 mm. long *Pseudofasciata* Scudd.

*d*². Process of the metazone sharp. Basal fuscous band of the tegmina not distinct from the spots of the immediate base. Smaller, male less than 20 mm. long *Lauta* Scudd.

Of the fifty-four species enumerated in the preceding key twenty-four are new. Sixteen species are confined to California as follows: *hyalina*, *rebellis*, *albolineata*, *porrecta*, *coquilletti*, *caliginosa*, *albescens*, *koebelei*, *thalassica*, *californica*, *pacifica*, *pilosa*, *fallax*, *conspersa*, *variegata*, and *pseudofasciata*. Three others are confined to the Pacific coast within the United States: *caeruleipes*, *bifasciata* and *similis*. Three are found east of the Mississippi: *maritima*, *saxatilis* and *citrina*. The last mentioned extends from the Rocky Mountains to Maryland. The first mentioned is restricted to the Atlantic coast and the shores of the Great Lakes and *saxatilis* is found

in northwest Arkansas and southern Illinois. Five species are not found within the limits of the United States. These are *tolteca*, *ochraceipennis*, *pallidipennis*, *lauta* and *collaris*. The remaining species, twenty-seven, belong to Rocky Mountain States. *Monticola* extends from Colorado into Mexico and *pistrinaria* from Texas into Mexico. *Cincta* ranges from California to Texas. *Texana* ranges from Texas to New Mexico; *cristata* from Lower California to Salt Lake Valley, Utah; *latifasciata* from Utah to Washington; *caeruleipennis* from California to Wyoming. Three species, *salina*, *agrestis*, *praeclara* are confined to Nebraska; three also, *nubila*, *modesta* and *melan-*

optera to New Mexico; two, *fratercula* and *campestris* to Wyoming.

The changes in synonymy are not great, a few of the most important may be noted. I have considered *fontana* Thos. as synonym of *juliana* Scudd.

Cincta Thos. is not the species as understood by Saussure and others, which was probably *vinculata* Scudd. I have considered *perplexa* Brun. a synonym of *azurescens* Brun.

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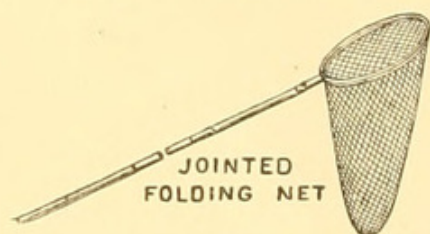
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