

MISCELLANEOUS.

On some Insects collected in the State of Chihuahua, Mexico. By T. D. A. COCKERELL, Entomologist of the New Mexico Agricultural Experiment Station.

THE species recorded below were collected by the writer partly in May 1893, under the circumstances mentioned in Ann. & Mag. Nat. Hist., July 1893, and partly during an hour or two spent at Juarez on Aug. 26, 1893. The latter locality is on the northern boundary of the State, just across the river from El Paso, Texas. Montezuma, the locality for some of the species, is the name of a station-house on the Mexican Central Railway.

The whole of the territory now considered strictly belongs to the arid Sonoran region—a region, however, which is more diverse in its fauna and flora than might be expected from the unusually uniform physical features. This diversity is perhaps to be accounted for by the fact that it is the meeting-ground of the Neotropical and Nearctic species, which mingle in different proportions according to the trend of the valleys, the altitude, and so forth. Once the Mexican tableland is left for the tropical sea-coast, the absolute dominance of the Neotropical fauna is beyond question; but on the plateau it cannot be said that the Nearctic forms occur to the exclusion of the Neotropical, although they certainly appear to have the upper hand. The warfare, if we may so term it, is carried on under peculiar conditions, owing to the inhospitable nature of the country, and the contest becomes largely one of endurance. Thus certain plants, such as the *Argemone*, may intrude into a zone (the mid-alpine) of which they are not typical, simply from their ability to flourish in waste and arid land. The same may be said of certain Cactaceæ, which at 8000 feet in Colorado look incongruous by the side of pines, spruces, and poplars.

The collections now enumerated may throw a little new light on these matters, being in many cases apparently the first records of the species from Mexico.

COLEOPTERA.

I am indebted to Mr. H. F. Wickham for the identification of these.

Coccinellidæ.

1. *Hyperaspis lateralis*, Muls.

Juarez.

2. *Scymnus tenebrosus*, Muls.

Juarez. (Houston, Texas; Arizona: Wickham.)

3. *Scymnus* near *cinctus*, Lec.

Juarez. A fine red-brown species.

Elateridæ.

4. *Anelastes Drurii*, var. *Latreillei*, Lec.

Samalayuca. (New Mexico, Arizona, &c.: Wickham. The species goes to the mid-alpine in Colorado.)

Malachiidæ.5. *Collops 4-maculatus*, Fabr.

Juarez. (Eastern U. S. to Texas and Arizona: *Wickham*.)

Scarabæidæ.6. *Trox scutellaris*, Say.

Between Montezuma and Ojo Caliente. (Mo. to Tex., Kans., New Mex., Ariz.: *Wickham*. See also Horn, Tr. Am. Ent. Soc. 1874, p. 3. Localities in Mexico are given in Biol. Centr.-Am.)

Cerambycidæ.7. *Tylosis maculata*, Lec.

Juarez. (Santa Fé, N. M.: *Boyle*. Albuquerque: *Wickham*. Arizona, Texas: *Leng*, in Ent. Amer. 1886, p. 118. Originally described from a specimen collected by Dr. Wizlizenus in New Mexico, probably west of Santa Fé.)

Chrysomelidæ.8. *Pachybrachys*, sp. n.

Juarez. (New Mexico: *Wickham*.)

9. *Metachroma*, prob. sp. n.

Juarez.

10. *Diabrotica*, sp.

Juarez. Appears intermediate between *D. vittata*, Fb., and *D. trivittata*, Mann., having antennæ like the former and legs like the latter.

11. *Diachus auratus*, Fab.

Juarez. (Common all over the western U. S., Colo., Ariz., New Mex., Calif., Vanc. I., &c.: *Wickham*.)

12. *Epitrix parvula*, Fab.

Juarez. (Mesilla Valley, N. M.: *Ckl.* U. S. and West Indies: *Wickham*.)

13. *Cassida pallidula*, Boh. (*texana*, Cr.).

Juarez. (Mesilla Valley, N. M.: *Ckl.* Albuquerque, N. M.: *Wickham*. It breeds on *Solanum elæagnifolium*, and its distribution may probably coincide with that of the host-plant. The larva, found at Las Cruces on Aug. 24, 1894, is green, with lateral spines.)

Dermestidæ.14. *Trogoderma sternale*, Jayne.

Juarez. (Las Cruces, N. M.: *Ckl.*)

Tenebrionidæ.15. *Argoporis bicolor*, Lec.

Between Montezuma and Ojo Caliente. (Arizona: *Wickham*.)

Anthicidæ.

16. *Notoxus serratus*, Lec.Juarez. (Las Cruces, N. M., Chaffee Co., Colo.: *Ckll.*)

Curculionidæ.

17. *Anthonomus inermis*, Boh.

Juarez. ("California.")

18. *Macrorhoptus* near *hispidus*, Dietz.

Near Santa Rosalia, on a malvaceous plant.

ORTHOPTERA.

Gryllidæ.

19. *Gryllus mexicanus*, Sauss.

Montezuma.

Acridiidæ.

20. *Haldemanella robusta*, Bruner.

Montezuma. (Arizona: Bruner, Pr. U. S. Nat. Mus. 1889.)

21. *Hippiscus* (*Xanthippus*) *zapotecus*, Sauss.

Montezuma.

The above three were kindly identified by Prof. L. Bruner, of Lincoln, Nebraska.

HYMENOPTERA.

The aculeate species, except the ants, were identified by Mr. Fox, of Philadelphia; the others went to the U. S. Department of Agriculture. Mr. C. Robertson assisted me with some of the bees.

Apidæ.

22. *Diadasia diminuta*, Cress.Juarez. (El Paso, Tex., Las Cruces, N. M.: *Ckll.* Colo.: *Cress.*)23. *Melissodes agilis*, Cress.Juarez. (Texas: *Cresson.*)24. *Perdita albipennis*, Cress.Juarez. (Las Cruces, N. M.: *Ckll.* Colo., Tex.: *Cresson.*)25. *Perdita hyalina*, Cress.Juarez. (Las Cruces, N. M.: *Ckll.* Colo.: *Cress.*)

Andrenidæ.

26. *Cilissa*, sp. n.?

Juarez.

27. *Colletes*, sp.

Juarez.

28. *Colletes consors*, Cr.

Juarez. (Colo., Texas: Cresson.)

29. *Colletes americana*, Cr., ♂.

Juarez. (Eastern States.)

30. *Augochlora pura*, Say.

Juarez. (Mesa Co., Colo.: Ckll. North to Canada.)

Philanthidæ.31. *Cerceris Kennicottii*, Cress.?

Juarez.

Scoliidæ.32. *Myzine hamata*, Say.

Juarez. (Las Cruces, N. M.: Townsend, Ckll. Cresson gives this as equivalent to *M. interrupta*, Say, from Pennsylvania.)

Mutillidæ.33. *Sphærophthalma Foxi*, Ckll.

Juarez. (Not known from any other locality.)

Formicidæ.

The ants were kindly identified by M. E. André.

34. *Tapinoma analis*, André.

Terrazas. (Only known from this locality.)

M. E. André has recorded *Dorymyrmex pyramicus* as found by me at Montezuma; but this is an error—the specimens were from El Paso, Texas. It may be well also to mention that I collected *Ectatomma concentricum* at Moneague, Jamaica, not Kingston, as M. André has it.

Myrmicidæ.35. *Aphænogaster Cockerelli*, André.

Montezuma. (Only known from this locality.)

36. *Atta octospinosa*, Reich.

Montezuma. (Torreon, Mexico: Ckll. Apparently not found in the U. S. Dalla Torre cites "Am. Mer.")

37. *Pogonomyrmex barbatus*, Sm.

Between Montezuma and Ojo Caliente; Ortiz. (Las Cruces, N. M.: Ckll. Texas, Arizona: Cresson. Dalla Torre cites Mexico.)

Cynipidæ.

38. *Eucoila*, sp.

Juarez.

39. *Holcaspis*, sp.

Juarez.

Both of these were new to Coll. U. S. Nat. Mus.

Braconidæ.

40. *Bathystomus*, sp.

Juarez. (The genus does not seem to occur in the U. S.)

41. *Idiasta*, sp.

Juarez.

Both of these new to Coll. U. S. Nat. Mus.

Chalcididæ.

42. *Eurytoma*, sp.

Juarez.

43. *Glyphe*, sp.

Juarez.

Both of these new to Coll. U. S. Nat. Mus.

LEPIDOPTERA.

Pieridæ.

44. *Pieris protodice*, Bdv. & Lec.

Juarez. (North to Canada.)

Nymphalidæ.

45. *Synchloë lacinia*, Geyer.

Juarez. (Neotropical, and north to Las Cruces, N. M.)

45 a. *Synchloë lacinia*, aberr. *rufescens*, Ckll.

Juarez.

Lycænidæ.

46. *Lycæna exilis*, Boisd.

Juarez. (Garfield Co., Colo., Las Cruces, N. M., Santa Fé, N. M. (one only): Ckll. Texas, Fla., Ariz., Calif.: W. H. Edwards.)

Hesperidæ.

47. *Pholisora catullus*, Fabr.

Juarez; identified by Dr. Skinner. (Colorado &c.)

Psychidæ.

48. *Oiketicus Townsendi*, Riley, MS., Towns.

Juarez. (Also Las Cruces, N. M., on tornillo, apple, and locust. Townsend only described the larva; the male moth has the cell

conspicuously dark brown, with a pale streak along its upper margin; otherwise it is not so very different from the description of *O. Abbotii* as given by Neumægen and Dyar, In. N. Y. Ent. Soc. 1894, p. 118.)

Noctuidæ.

Kindly identified by Prof. J. B. Smith.

49. *Carneades insignata*, Walk.

Montezuma. Prof. Smith gave me this name; but in his Catalogue (1893) he places it as a synonym of *C. insulsa*, Walk., which extends to Nova Scotia.

50. *Cirrhobolina mexicana*, Behr.

Montezuma. (Colo., New Mex., Ariz., Tex.: *Smith*. The species belongs to the arid region, but it is of a Neotropical type.)

Geometridæ.

Kindly identified by Mr. Hulst.

51. *Semiothisa californiata*, Pack.

Montezuma. (Las Cruces, N. M.: *Ckll.* Calif., Texas, Kansas, Nebraska: *Packard*.)

52. *Phibalapteryx intestinata*, Gn.

Montezuma. (Extends to Maine and Canada: *Pack*.)

HOMOPTERA.

Membracidæ.

53. *Stictocephala festina*, Say.

Juarez. (Las Cruces, N. M.: *Ckll.* Florida: *Say*.)

Coccidæ.

54. *Ceroplastodes niveus*, Ckll.

Montezuma. (Not known from elsewhere; the genus has one other species, from the Mesilla Valley, N. M.)

55. *Ceroplastes irregularis*, Ckll.

Between Montezuma and Ojo Caliente. (Mesilla Valley, N. M.: *Ckll.*)

I will take this opportunity of giving some fresh information about *C. irregularis*, based on the study of Mesilla Valley specimens. It is found on *Atriplex canescens*, and when alive is much whiter and more regular than my original types, which were old and injured by drying. The female with the wax removed is $4\frac{1}{2}$ millim. long, nearly the shape of *Lecanium hemisphæricum*; the dorsum is rounded, smooth and shiny, and has no boss; the sides show irregular gibbosities; the caudal spine or tail is short and stout, but distinct.

On March 13, 1894, females were found with eggs, which are pink in colour. The number of eggs laid by one female is very great; I estimated them at a thousand. From the Mesilla Valley specimens I bred some numbers of a Chalcidid parasite, the *Aphycus ceroplastis* of Howard.

Looking over the above list of Chihuahua State insects, it will be seen that the Nearctic types largely preponderate, and that some few are even boreal. But it is proper to state that several of the species taken have not yet been identified; and as the specimens were mostly submitted to specialists who are much more familiar with the Nearctic than the Neotropical fauna, it may be assumed that the unnamed species were probably largely Neotropical. Consequently, had everything found been named, the percentage of Neotropical types might have been larger.

The localities cited are all over 3000 feet above sea-level; Juarez is about 3700 feet, Montezuma about 4500 feet, Damalayuca about 4200 feet, Ojo Caliente about 4200 feet, Ortiz about 3800 feet.

Las Cruces, New Mexico, U.S.A.,
Nov. 13, 1894.

On the Nutrition of Two Commensals (Nereilepas and Pinnotheres).
By M. HENRI COUPIN.

It is a well-known fact that in the whelk-shells inhabited by hermit-crabs the annelid *Nereilepas fucata* is very frequently found. This worm takes up its abode in the first whorls of the spire—that is to say, in a chamber which is almost completely closed by the posterior portion of the crab. It is, however, very well developed, in no way foul, and is, so to speak, resplendent with health. Herein there is nothing that need astonish us, as it is admirably protected against injuries and enemies from without. But the question arises, as to how it is able to obtain food. It is generally supposed that it is contented with consuming the excrement of the hermit-crab, which is voided in the very spot in which it is found. With a view to ascertaining if this is really the case I made various observations and experiments, which show that this hypothesis has no foundation in fact.

Let us actually examine a hermit-crab having a *Nereilepas* as its co-tenant. The crab has two principal modes of feeding. Under ordinary circumstances it is content to devour the particles which are brought into contact with its mouth by the rapid movements of its appendages: the refuse of these matters after digestion passes to the exterior in the shape of a cylindrical roll, more or less elongated, about 1 millim. in diameter, and easily to be distinguished from the faeces of the worm, which are filiform. If the worm devoured these evacuations, it is very evident that they would not be seen to pass out of the shell. During the whole of the time that



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