Proceedings of the Iowa Academy of Science

Volume 19 | Annual Issue Article 44

1912

A Systematic Outline of the Reduviidae of North America

Stanley R. Fracker

A SYSTEMATIC OUTLINE OF THE REDUVIIDAE OF NORTH AMERICA.

STANLEY B. FRACKER.

BIBLIOGRAPHY.

The following bibliography is intended to include only those works in which a new contribution is made to the study of the family. I have not had access to some, but the descriptions of all species except those of Provancher have been quoted by Champion, Uhler or Stal and are thus made available. These books and papers have been freely used, especially for verification of details and for localities, credit being given in those cases where an author is wholly or partially responsible for the characters used in keys, etc.

No attempt has been made to give a separate and complete bibliography for each species. With each genus is given a list of the most easily accessible and useful references. In practically all cases a good description of all the species will be found by referring to these works. They are mentioned by author and page. Where more than one work is accredited to an author in the following list, they are distinguished by (a), (b), etc. Additional information about many of them may be obtained from the partial bibliography by Nathan Banks.

Amyot, C. J. B., et Serville: Histoire Naturelle des Insectes. Hemipteres. (1843).
Banks, Nathan: (a) A list of Works on North American Entomology. U. S. Bur. Entom., Bul. 81, n. s. (1900).
(b) Entomological News, xxi, p. 324. (1910).
(c) Catalogue of Nearctic Hem. Het. (Am. Ent. Soc. 1910).
Bergroth: (a) Revue d'Entom. 1905, 112.
(b) Entom. News, 1897, 96.
Burmeister, H: Handbuch der Entomologie, ii. (1835).
Caudell, A. N.: (a) Canadian Entomologist, xxxii, p. 67, (1900).
(b) Jour. N. Y. Ent. Soc., x, p. 1 (1901).
Champion, G. C.: Biologia Centrali-Americana. Rhynchota. ii. (1898-1902).
Costa: in Ann. Mus. Zool. Nap. ii, p. 80 (1864).
DeGeer: Mem. des Ins. iii. (1773).
Dohrn: Linn. Ent. xiv.
Drury: Illustr. i.
Erichson: Schomb. Reisen British Guiana. iii, p. 613. (1848).
Fabricius: (a) Entomologia Systematica, Vol. iv. 1794.
(b) Systema Rhyngotorum. 1803.
Fallou: in (a) Le Naturaliste, (1889), p. 131ff.
Fieber, F. X.: Die Europaischen Hemiptera. (1861).
Germar: (a) Magazin der Entomologie, i, b. (1815).
(b) Reise nach Dalm., p. 286 (1817).
Gmelin: Syst. Nat. i. 4 (1788).
Guerin: Mag. Zool. 1830-40.
Hahn, C. W., und Herrich-Schaeffer, G. A. W.: Die wanzenartigen Insekten. (10 vol. 1831-53).
Howard, L. O.: Heteroptera responsible for "spider bites." Pop. Sci. Monthly, Nov. 1899, pp. 31-42.
Kirkaldy: Entom. 202 (1900).
Klug: Symb.Phys. ii, pl. ix (1830).
Kolenati: Meletemata Entom. vi, p. 42. (1857).
Laporte: in Guerin's Mag. Zool. 1832.
Lamarck: Syst. Nat. 1801, p. 296.

Latreille: in Humb. et Bonpl. Obs. Zool. i. (1811).
LeConte, J. L.: in Proc. Acad. Nat Sci. Phila. vii. (1855).
Lepeletier et Serville: Encycl. Meth. x. (1825).
Lethierry et Severin: Catalogue general des Hemipteres. (1893).
Linnaeus: Syst. Natur., ed. 12, i, part 2. (1767).
Mayr: Reise der Novara. Hemiptera.
Montandon: in P. U. S. Nat. Mus. xvi, p. 50, 1893.
Montr. et Signoret: Ann. Soc. Ent. France (1861).
Perty: Del. Anim. Art. Brazil, p. 173.
Provancher: (a) Petite Faune du Canada. Hemip. 1887, p. 182.
(b) Naturaliste Canadien, iv, p. 106. (1876).
Reuter, O. M.: (a) Scandinaviens och Finland Reduviider. (1872).
(b) Act. Soc. Fenn. 1882, xii, 728.
Say, Thomas: The Entomology of North America. (1859).
Serville: in Ann. Sci. Nat. Vol xxiii, p. 218. 1831.
Signoret, V.: in Ann. Soc. Ent. France, viii. (3rd ser.)
Spinola, Max: Essai sur les Genres d'Insectes, appartenant a l'ordre des Hemipteres. (1837).
Stal, Carolus: (a) Bidr. till Rio Janeiro-traktens Hemipter fauna, i. (1862).
(b) Hemiptera Africana, iii. (1865).
(c) Bidr. till Reduviidernas Kannedomen. Ofv. vet.-Ak. Förh. 1866, pp. 235-302. Ibid. 1859, p. 371.
(d) Analecta Hemipterologica. (From Berlin. Entom. Zeitschrift 1866-9.)
(e) Hemiptera Fabriciana, i, (1868).
(f) Enumeratio Hemipterorum, ii. (1872).
(g) Stett. Ent. Zeit. 1862.
(h) Berl. Ent. Zeit. Vol. iii. p. 104. 1859.
Thunberg: Nov. Ins. Sp. ii, 33 (1783).
Uhler, P. R.: (a) List of Hemip. west of Miss. river.
U. S. Geol. and Geog. Surv. Terr., Bul., Vol. 1, 1875, pp. 267-361.
(b) Rept. on Ins. Col. in Exploration of 1875.
U. S. Geol. and Geog. Surv., Bul., Vol. iii, No. 2, pp. 355-475. (1875).
(c) Hemiptera; in The Standard Natural History, ed. by Kingsley, vol. ii. (1884-5).
(d) Checklist of the Hemiptera Heteroptera of North America. (1886).
(e) Heteropterous Hemiptera of Lower California.
Proc. Cal. Ac. Sci. Vol. iv (ser. 2). 1894.
(f) P. Z. S. 1894.
(g) Proc. Ent. Soc. Wash., iv, p. 508, (1901).
VanDuzee: (a) Can. Ent. Nov. 1912, p. 324.
(b) Ent. News, 1906, 390.
Walker: Catalogue of Hemiptera Heteroptera.
Westwood: Introduction to the Modern Classification of Insects. (1839).
Wolff: Icones Cimicum, iii.

INTRODUCTION.

The "Assassin Bugs," the family Reduviidae, in the United States form one of the more obscure groups of Rhynchota. Though the species are many, individuals are few and injure neither crops nor domestic animals. Half a dozen species have attracted attention at times by biting human beings with very painful results. One of them has been named "The Kissing Bug" for the lips have often been the point of attack. In spite of glaring newspaper headlines on the subject there is practically no chance of their becoming so numerous as to be dangerous to men and the bite is no more likely to be fatal than a wasp's sting, (Howard, 1899). Spiders have often been blamed for wounds undoubtedly inflicted by these bugs.

The Reduviidae belong to the superfamily Reduvioidea of the section Trochalopoda, suborder Heteroptera, order Rhynchota. The Trochalopoda are bugs which have the coxae of the hind legs acetabulate, rotating and ungrooved. The Reduvioidea are characterized by terminal tarsal claws and by having the metathoracic epimera wholly uncovered. This includes three families, Emesidae, Reduviidae, and Nabidae, the Reduviidae being distinguished from the other two by the body, which is of ordinary form (not greatly elongate), the three jointed beak, the four jointed antennae, and the two dorsal ocelli. In four of the genera, however, the ocelli are absent.

At present no satisfactory and comprehensive systematic work on this and many other families of Heteroptera exists in any language. Stal's "Enumeratio Hemipterorum," published in 1872, with its fragmentary keys and occasional descriptions furnishes practically the only means for the rapid determination of genera. For the species one is referred to the obscure magazines in which the descriptions were originally published. Champion's work on the Heteroptera of Central America, with its excellent figures, keys to species and lists of synonyms is invaluable for the tropical American species but he gives no method for the identification of genera.

In this paper are included all forms found recorded in America north of the southern boundary of Mexico, and in the West Indies. Fifty-six genera and 168 species are treated, keys being given which it is hoped will materially aid in the identification of specimens to genus and species. For the genera Stal's writings have been largely translated, the method of introduction of several later genera being original, based on descriptions, and specimens. Champion's work has been used in the discussion of species although the difference in the territory covered has necessitated many changes in his keys both in omission and in the introduction of new material. In most cases statements have been verified by comparisons of specimens, figures of different writers, descriptions, etc.

Thanks are due to Professor H. E. Summers for kindly placing at my disposal the excellent collections of Iowa State College and for the use of certain unpublished material of his own. I wish also to acknowledge my obligation to the librarian of Iowa State College for aid in securing literature from the Congressional Library of Washington, D. C., and to Mr. C. A. Hart of Urbana, Ill., for many corrections and suggestions.

KEY TO GENERA.

A. Ocelli none; wings and hemelytra always present in adults; no discoidal areole at proximo-anal angle of anal areole of membrane. **Saicinae.**

B. Scutellum and posterior lobe of pronotum armed with spines; ante-ocular part of head short; anterior femora unarmed.....2. SAICA

BB. Pronotum unarmed; scutellum sometimes with one terminal but never with dorsal spines.

C. Ante-ocular part of head long, subcylindric; anterior lobe of pronotum narrow .....3. ORTHOMETROPS

CC. Ante-ocular part of head very short.

D. Anterior femora unarmed; anterior lobe of pronotum wider than long; apex of scutellum produced into a long spine.....
5. ONCEROTRACHELUS

DD. Anterior femora with a double row of spines; anterior tibiae with three long spines .....4. TAGALIS

AA. Ocelli present in winged individuals.

B. Anterior coxae nearly as long as femora, four times as long as wide; anterior femora with a row of spines beneath; membrane with single closed areole. **Bactrodinae** .....1. BACTRODES

BB. Anterior coxae short.

C. Hemelytra without a quadrangular or discoidal areole at the proximo-anal angle of the anal areole of the membrane.

D. Ocelli not farther cephalad than the caudal margins of the eyes; joint 2 of antennae simple.

E. Thorax usually constricted caudad of middle; anterior coxae externally flat or concave. **Piratinae.**

F. Middle tibiae without spongy fossa; head long; no lateral tubercles on neck .....28. SIRTHENIA

FF. Middle tibiae with spongy fossa; fore tibiae convex above.

G. Neck destitute of lateral tubercles; head constricted immediately behind eyes.....24. THYMBREUS

GG. Neck with a small tubercle on each side.

H. Cephalic half of pronotum without oblique sulci; metapleural sulci distant from margin; apical spongy part of anterior tibiae produced into a lamina more than one-fourth the length of the tarsi.....25. TYDIDES

HH. Cephalic half of pronotum with oblique sulci; lamina of anterior tibiae short.

I. Apical portion of anterior tibiae angularly dilated beneath, the spongy fossa being preceded by a small prominence .....26. MELANOLESTES

II. Tibiae not dilated as in I; spongy fossa elongate; metapleural sulci close to margin.....27. RASAHUS

EE. Thorax constricted in the middle or cephalad of the middle; anterior tarsi three jointed.

F. Apex of scutellum narrow, without spines or with a single spine. **Reduviinae.**

G. Antennae inserted in lateral or dorso-lateral margins of head; antenniferous tubercles slightly projecting from sides of head; head produced strongly cephalad.

H. Ocelli at least as far apart as the eyes.

I. Antennae inserted very near apex of head; joints 1 and 3 of rostrum short, joint 2 nearly four times as long as joint 1.....23. RHODNIUS

II. Insertion of antennae various, remote from apex of head, sometimes nearly as close to eyes as to apex of head.

J. Body slightly hairy; pronotum distinctly constricted, angles distinct; anterior lobe quadrituberculate with the middle tubercles large and conical..22. MECCUS

JJ. Body glabrous, margins of pronotum sinuous, scarcely constricted; anterior lobe lined with little tubercles .....21. CONORHINUS

HH. Ocelli not nearly so far apart as eyes; pronotum armed with dorsal tubercles .....20. MACROPHTHALMUS

GG. Antennae inserted on top of head between margins, close to eyes; antenniferous tubercles not projecting from side of head.

H. Femora unarmed above; prosternum without row of setigerous teeth; anterior tibiae usually with spongy fossa.

I. Anterior lobe of pronotum with a bispinous or bituberculate disc; femora unarmed.....19. SPINIGER

II. Disc of pronotum unarmed; apex of scutellum produced into a spine.

J. Ocelli close to eyes; eyes large and close together. 18. REDUVIUS

JJ. Ocelli remote from eyes.

K. Femora armed on both sides with an acute little tooth or spine; prominent tubercle on each side of neck; lobes of pronotum distinct; eyes small, separated .....17. LEOGORRUS

KK. No tubercle on neck; lobes of pronotum indistinctly separated.....16. ALLOEOCRANUM

HH. Fore femora spinose, at least, below; prosternum armed with row of blunt setigerous teeth; no tibial fossa.

I. Middle tibiae neither incrassate nor spinose; anterior lobe of pronotum rugose.....14. NALATA

II. Middle tibiae incrassate and spinose; middle femora spinose; anterior lobe of pronotum not rugose..... 15. MICROLESTRIA

FF. Apex of scutellum broad, with two or three spines. **Ectrichodiinae.**

G. Joint 1 of rostrum more than half as long as head, longer than joints 2 and 3 together; joint 1 of antennae short. 29. POTHEA

GG. Joint 1 of rostrum not extending behind eyes, subequal in length to joint 2; joint 1 of antennae about as long as head .....30. ECTRICHODIA

DD. Ocelli cephalad of hind margins of eyes; joint 1 of antennae stout, joint 2 of many jointlets. **Hammatocerinea.**

E. Antennae inserted near eyes; head in front of eyes short, subequal to distance between eyes.....32. HOMALOCORIS

EE. Antennae remote from eyes; head in front of eyes over twice as long as distance between eyes.....31. HAMMATOCERUS

CC. Hemelytra with a quadrangular or discoidal areole at the proximo-anal angle of the anal areole of the membrane.

D. Anal areole of the membrane not extending as far proximad as the costal areole; basal joint of antenna thickened, porrect; other joints slender, folding back beneath head and joint 1. **Stenopodinae.**

E. Head armed with a ramous or furcate spine below on each side caudad of the eyes.

F. Joint 1 of antenna incrassate, apex produced in a spine beyond insertion of joint 2.....6. PNIRONTIS

FF. Joint 1 of antenna not produced beyond the insertion of joint 2.

G. Apex of head at base of rostrum unarmed; joint 1 of rostrum extending caudad of eyes, nearly twice as long as the two apical joints together; fore femora unarmed..... 7. PYGOLAMPIS

GG. Apex of head produced into a short, porrect obtuse spine on each side at base of rostrum; joint 1 of rostrum extending to caudal margin of eyes, subequal in length to the two apical joints together; fore femora with a double series of short spines below.....8. GNATHOBLEDA

EE. Head unarmed below or armed with a simple spine; rarely with a subfurcate spine at sides of base.

F. Ocelli not at all or only slightly elevated; postocular part of head not at all or very slightly and uniformly narrowed caudad .....10. STENOPODA

FF. Ocelli considerably elevated, postocular part of head short, strongly narrowed caudad (margins as seen from above, curved).

G. Joint 1 of rostrum nearly as long as or longer than joints 2 and 3 together.

H. Joint 1 of rostrum slightly longer than joints 2 and 3 together; hind femora not reaching apex of abdomen; fore femora armed beneath; head produced cephalad from bases of antennae.....9. SCHUMANNIA

HH. Joint 1 of rostrum slightly shorter than joints 2 and 3 together; fore femora unarmed, slightly incrassate; hind femora scarcely reaching apex of abdomen; head not produced cephalad from bases of antennae.12. DIADITUS

GG. Joint 1 of rostrum not longer than joint 2.

H. Joints 1 and 2 of rostrum of equal length; fore femora very little thickened, unarmed; hind femora reaching beyond apex of abdomen.....11.NARVESUS

HH. Joint 1 of rostrum much shorter than joint 2; fore-femora incrassate, with small spines below; hind femora just reaching apex of abdomen....13. ONCOCEPHALUS

DD. Anal areole of membrane extending farther proximad than costal areole.

E. Ocelli farther apart than the eyes. **Apiomerinae** 33. APIOMERUS

EE. Ocelli not so far apart as the eyes. **Zelinae.**

F. Posterior lobe of pronotum inflated, produced backward over scutellum and also nearly covering anterior lobe..... 37. NOTOCYRTUS

FF. Pronotum not inflated nor produced over scutellum.

G. Sides of mesosternum without a tubercle or fold in front.

H. Fore femora as long as or longer than hind femora; joint 1 of rostrum much shorter than joint 2.

I. Lateral angles of pronotum unarmed; joint 1 of rostrum shorter than or subequal in length to part of head before eyes. (Subgenus Zelus).....39. ZELUS

II. Lateral angles of pronotum armed.

J. Posterior disc of pronotum unarmed.

K. Spine at posterior lateral angles without a tooth behind at its base; abdomen linear..... 36. DARBANUS*

KK. Pronotum at posterior angles armed with a sharp spine and behind it a tooth giving it a bispinous appearance; abdomen showing a little at each side of the elytra. (Subgenus Diplodus)... 35. ZELUS*

JJ. Disc of pronotum armed with two spines. (Subgenus Pindus).....35. ZELUS

HH. Fore femora shorter than hind femora, rarely of equal length, in this case joint 1 of rostrum as long as or longer than joint 2.

I. Joint 1 of rostrum shorter than joint 2; fore femora a little shorter than hind femora; joint 1 of rostrum distinctly longer than head before eyes.34. PSELLIOPUS

II. Joint 1 of rostrum as long or longer than joint 2.

J. Postscutellum acute, produced into a tooth; head long, bispinous .....38. DEBILIA

JJ. Postscutellum not acutely prominent behind scutellum.

K. Two spines on apex of femora...39. RICOLLA

KK. Apex of femora without spines or with two very short ones.

L. Pronotum armed with spines on the disc.

M. Fifth and sixth abdominal segments conjointly and abruptly dilated, their margins forming an acutely angled foliaceous plate, armed with an apical spine; antennae as long as body .....43. SOSIUS

MM. Penultimate segment of abdomen unarmed and not dilated.

N. Juga distinctly prominent at the apex and often acute or subacute; fore femora distinctly incrassate; hemelytra usually not reaching apex of abdomen.

O. Head as seen from the side gradually narrowed behind the eyes..... 41. ROCCONOTA

OO. Head as seen from the side suddenly constricted at base. (In part)..... 42. FITCHIA

NN. Juga when prominent obtuse at apex; eyes full width of head; fore femora not in-

*See page 241.

crassate; pronotum with four spines on posterior lobe.....40. REPIPTA

LL. Pronotum unarmed on the disc.

M. Apical angles of penultimate segment of abdomen armed with a prominent spine; antennae about three-fourths as long as body; fifth and sixth abdominal segments not greatly dilated .....47. ATRACHELUS

MM. Apical angles of penultimate segment of abdomen unarmed.

N. Ocelligerous part of head not elevated; lobes of pronotum indistinctly separated. (In part) .....42. FITCHIA

NN. Ocelligerous part of head elevated.

O. Femora thickened, body rather stout; joint 1 of antennae shorter than head and pronotum together.....44. CASTOLUS

OO. Body and legs slender; eyes prominent in male; joint 1 of antennae as long as head and pronotum together.

P. Fore femora subequal in length to head and pronotum together.....
46. GRAPTOCLEPTES

PP. Fore femora longer than head and pronotum together...45. HIRANETIS

GG. Sides of mesosternum with a tubercle or fold in front at the hind angles of the prosternum; joint 1 of rostrum longer than part of head cephalad of eyes.

H. Fore femora thickened, spinous, densely granulated; hind femora unarmed.

I. Fore tibiae with three long spines on the ventral side.
54. SINEA

II. Fore tibiae unarmed.

J. Fore femora armed above with a long spine near the apex.....53. SINDALA

JJ. Fore femora without subapical spine above.....
52. ACHOLLA

HH. Fore femora unarmed, rarely a little thickened, a little granulated.

I. Pronotum produced caudad over scutellum with a high mesal tuberculate ridge.....50. ARILUS

II. Caudal lobe of pronotum six sided, not elevated nor produced caudad.

J. Fore tibia armed with a tooth on the ventral side; apical angle of the corium not produced beyond the middle of the membrane.....51. STHIENERA

JJ. Fore tibia without a tooth below; apical angle of the corium produced beyond the middle of the membrane.

K. Sides of the posterior lobe of the pronotum armed with a tooth or knob near the produced lateral angles; joint 2 of rostrum distinctly longer than joint 1.....48. PLOEOGASTER

KK. Sides of posterior lobe of pronotum without a tooth or knob near the lateral angles; posterior lobe with four spines.....49. HEZA

SYNOPSIS OF THE SPECIES.

Subfamily **BACTRODINAE.**

BACTRODES Stal.

Stal, (a) 80, (f) 124; Champion, 175.

Individuals of this genus are not found north of central Mexico. They are as closely related to Emesidae as to Reduviidae, differing from the former in the less elongate anterior coxae and the cephalic prolongation of the ventral part of the prothorax. The two species occurring in central Mexico are separated by Champion as follows:

a. Head and pronotum not spinose except feebly at the sides of the anterior lobe of the pronotum; scutellum with a short spine; abdomen not foliaceous at sides .....*biannulatus.*

aa. Head and pronotum with spines bearing hairs; scutellum and post scutellum each with a long spine; fifth abdominal segment strongly foliaceous .....*spinulosus*

B. BIANNULATUS *Stal.* Mexico.

B. SPINULOSUS *Stal.* Mexico.

Subfamily **SAICINAE.**

SAICA Am. et S.

Amyot et Serville, 371; Stal, (e) 129; Champion, 176.

Anterior femora are setose; middle and hind legs are long; scutellar and pronotal spines are long.

a. Femoral setae regularly arranged; legs, antennae and elytra nigro-fuscous; base of femora and costa of elytra vermillion red.....*fuscipes.*

aa. Femoral setae irregularly arranged; femora and base of tibiae vermillion red; rest of legs and antennae brownish.....*tibialis.*

aaa. Femoral setae regular; legs and antennae fuscous to nigro-fuscous; elytra ochraceous .....*recurvata.*

1. S. FUSCIPES *Stal.* Mexico.
2. S. TIBIALIS *Stal.* Mexico.
3. S. RECURVATA *Fabr.* (*Zelus recurvata* Fabr.=*Saica rubella* Am. et S.) Mexico.

3. ORTHOMETROPS Uhler

Uhler (Proc. Ent. Soc. Wash., iv, p. 508, 1901.)

This is a monotypic genus easily distinguished from the other Saicina by the long head and the unarmed pronotum.

O. DECORATA *Uhler* is a greenish yellow form found in Pennsylvania.

3a. SAICODES Uhler

S. ANNULATUS *Uhler* is recorded (Uhler, d) as having come from the western United States. No descriptions of genus and species seem to have been made. It will be necessary for some one to find the insect in one of Uhler's former collections and publish a description of it.

4. TAGALIS Stal

Stal, (a)76, (e)130, (f)124; Champion, 179.

This genus is easily separable from other Saicinae by the spines on the anterior tibiae and femora. A second species from Panama has been described by Champion.

T. INORNATA *Stal* (=*Saica annulipes* Uhler) is described with the genus. The femora are yellowish, usually with a narrow brown or black annulus before the tip. Range is south from southern Mexico.

5. ONCEROTRACHELUS Stal

Stal, (e)130, (f)124; Champion, 180.

Only one of the two known species of this genus occurs in North America.

O. (*Reduvius*) ACUMINATUS *Say* (p. 356):"Body yellow, hairy; joint 1 of rostrum longer than joints 2 and 3 together; scutellum with three elevated lines and terminating in an acuminated spine; anterior lobe of the pronotum longer than the posterior." Range includes New Jersey, South Carolina, Indiana, Mexico and Panama.

Subfamily **STENOPODINAE**

6. PNIRONTIS Stal

Stal, (b)149, (e)126, (f)120; Champion, 181; (=*Centromelus* Fieber, pp. 42, 151.)

Stal's later references to this genus only mention the characters given in the key. Champion says that the first joint of the antenna has a stout, rigid spiniform prolongation extending beyond the insertion of the second joint, joints 2-4 which are slender, folding backward under the head and being received with the rostrum along the under side of the head in a groove.

a. Tibiae armed on anterior edge with three spines only.
   b. Basal joint on antennae spinose beneath; genae not prominent. *infirma*
   bb. Basal joint of antennae unarmed; genae very prominent..... *languida*
aa. Tibiae possessing a long terminal spur near the third spine on the anterior edge ..... *modesta*

P. MODESTA *Banks* (b) from Virginia is a pale greenish yellow species resembling certain South American forms. The latter, however, possess several additional tibial spines.

P. INFIRMA *Stal* is distinguishable from the other North American species by the basal joint of the antennae being spinose beneath and the genae not being prominent. Illinois, Carolina, Mexico, Panama.

P. LANGUIDA *Stal* has very prominent genae and the basal joint of the antennae is unarmed. Carolina, Texas, Mexico, etc.

7. PYGOLAMPIS Germar

Germar: Reise nach Dalm. p. 286; Burmeister, 246; Stal. (e)126, (b)149, (f)121; (=*Ochetopus* Hahn, i, 176.)

Species of Pygolampis are distributed all over the world. Three of the eleven described species occur in America, one of them only in Panama and Guiana. The other two may be separated as follows:

a. Head, thorax and scutellum and veins of the hemelytra gray-sericeous; antennae short with the first segment subequal in length to the ante-ocular part of the head; fore femora incrassate.....*sericea*

aa. Body slightly sericeous above, antennae longer; with the first segment longer than the ante-ocular part of the head; fore femora only slightly incrassate .....*pectoralis*

P. SERICEA *Stal.* Pennsylvania and temperate America.

P. PECTORALIS *Say* (=P. *fuscipennis* Stal). Massachusetts to Florida, Texas and California.

8. GNATHOBLEDA Stal

Stal, (e)126, (f)121; Champion, 184.

This genus may be recognized by a row of stout setiferous spines on each side of the post-ocular portion of the head beneath. The two North American species are "doubtfully distinct" (Champion).

G. LITIGIOSA *Stal.* Mexico.

G. TUMIDULA *Stal.* Cuba, Texas and south.

Stal: *G. tumidula* differs from the preceding species in the slightly narrower head, with its distinctly rounded and tumescent ante-ocular part, in the narrower posterior lobe of the thorax, and the median transverse vitta.

9. SCHUMANNIA Champion

Champion, 185.

This genus was named from a single specimen secured at Vera Cruz, Mexico. It differs from related American genera in the long first joint of the rostrum, the armed fore femora, etc.

S. MEXICANA *Champion* is grayish ochreous, mottled with fuscous. It is 18mm. long. Banks (c) records its presence in North Carolina.

10. STENOPODA Laporte

Laporte, Guer. Mag. Zool. 1832, p. 26; Stal, (b)149, (e)127, (f)122; Champion, 187.

Ante-ocular part of the head is two or three times as long as the post-ocular part; the first joint of the rostrum is slightly shorter than the two apical joints together; eyes slightly transverse.

S. CULICIFORMIS *Fabr.* (*Gerris* [*Cimex*] *culiciformis* Fabr. =*S. cinerea* Lap. =*subinermis* Stal =*cana* Uhler) Cuba, Mexico, Texas, Florida, etc. The insect is gray with black spots on the elytra and black margins on the scutellum.

11. NARVESUS Stal

Stal, (e)128, (f)124; Champion, 188.

A monotypic North American genus.

N. CAROLINENSIS *Stal* has been found in Missouri, Carolina, Texas, Mexico and the Antilles. The lateral angles of the pronotum vary from acute to rounded at the apex; the post-ocular portion of the head is armed with two subconical tubercles.

12. DIADITUS Stal

Stal, (e)128, (b)150, (f)124; Champion, 188.

Only one of the four described species of this genus occurs north of Panama. The genus may be distinguished by the characters given in the key.

D. PICTIPES *Champion.* Texas, Mexico. Joint 1 of antennae shorter than head; joint 2 about one-fourth longer than 1 and clothed with projecting hairs; frontal spines stout, blunt at tip; eyes small; anterior tarsi with joints 2 and 3 almost fused into one.

13. ONCOCEPHALUS Klug

Klug (1830); Stal, (e)128, (f)123 (*Spilalonius.*)

O. GENICULATUS *Stal.* Body a pale grayish yellow, slightly hairy; legs yellow, glabrous; antennae of the male slightly longer than the ante-ocular part of the head; posterior femora just reaching apex of abdomen. Southern U. S.

O. APICULATUS *Reuter* (b). Antennae of the male scarcely equalling in length the ante-ocular part of the head; posterior femora not reaching apex of abdomen. Missouri.

Subfamily **REDUVIINAE.**

14. NALATA Stal

Stal, (a)79, (b)123, (f)110, 119; Champion, 190.

The head has three prominent, conical, setiferous tubercles on each side beneath; the femora are asperate and setose; the anterior trochanters are each armed with a stout spine.

a. Anterior lobe of pronotum with a regular marginal row of tubercles and a second regularly arranged row near the median sulcus.....*rudis.*

aa. Anterior lobe of pronotum with marginal rows of tubercles scattered and irregular, but median rows regular.....*setulosa.*

N. RUDIS *Stal.* Mexico.

N. SETULOSA *Stal.* Mexico.

15. MICROLESTRIA Stal

Stal, (f)110, 120; Champion, 195.

Stal separated this genus from *Nalata* fourteen years after the latter had been described (1858-72.) Some of the principal differences in the later genus are the presence of tubercles on the anterior lobe of the pronotum, the presence of a spine on the anterior trochanters and the distinct separation of the membrane and corium.

M. FUSCICOLLIS *Stal,* (a) 80. Head pronotum and scutellum, dull and rugulose; anterior lobe of pronotum distinctly tuberculate. Mexico and southward.

16. ALLOEOCRANUM Reuter

Reuter calls this a subgenus of Stal's *Microcleptes*. Leth. et Severin (96, 261) use this name for the genus, Microcleptes being preoccupied in Coleoptera.

Stal, (c)240, (f)109, 119; Reuter, Act. Soc. Fenn, xii, p. 332. (1881.)

A. BIANNULIPES *Montr. et Sign.*, (1861, p. 69) was transferred from *Opsicoetus* by Stal to form this monotypic genus. It is found in Cuba, Panama and the islands of the Pacific.

17. LEOGORRUS Stal

Stal, (f)109, 118; Champion, 197.

The following key to the species has been adapted from Champion:

a. Posterior lobe of the pronotum transversely rugose; head with lateral post-ocular portions nearly twice as long as eyes, latter prominent; membrane with nervures slightly ochreous; over 18 mm. long..... *formicarius* Fabr.

a. Posterior lobe of pronotum smooth or faintly rugulose; length 11-16 mm.

b. Head with lateral post-ocular portions not longer than eyes, latter large, prominent; nervures ochreous.....*litura* Fabr.

bb. Head with lateral, post-ocular portion longer than eyes, latter moderately large or small; nervures not ochreous.

c. Elytra with rather large patch below base and apex of corium broadly ochreous; post-ocular portion of the head little longer than the eyes .....*venator* Stal

cc. Elytra with small ochreous patch below base; post-ocular portion of head very much longer than eyes.....*longiceps* Champ.

L. FORMICARIUS *Fabr.* (*Reduvius formicarius* Fabr. [b, 280] =*Platymeris formicaria* Burm. =*Acanthaspis formicaria* Walk. =*Reduvius lugubris* Walk. =*R. plagipennis* Walk. =*R. areolatus* Walk.) Mexico.

2. L. LITURA *Fabr.* (=*Cimex cayennensis* Gmel. =*Platymeris myrmecodes* H-Sch. =*Reduvius signifer* Walk =*R. partitus* Walk.) Mexico.

3. L. VENATOR *Stal.* Mexico and Costa Rica.

4. L. LONGICEPS *Champ.* Mexico.

18. REDUVIUS Lamarck.

Lamarck, 298; Klug; Stal (b)138, (f)108, 119 (*Opsicoetus*).

The sting of the species of this genus results in a swelling more painful than that of a bee. Two species have been recorded from North America, one of which is our very notorious "kissing bug."

R. PERSONATUS *Linn.* (724) (Fabr. (a)194, (b)257; Howard, 33) has received unusual attention on account of its large size and wide distribution. The color is piceous. Synonyms: *R. pungens* LeC., *Cimex quisquilius*, DeG. and *R. albosignatus* Prov.

R. SENILIS *VanDuzee*(b) was described in 1906 from a specimen from Arizona. It is only 10 mm. long and is pale testaceous in color, "inclining to piceous on the head, pronotum and scutellum." The small size and light color distinguish it from *R. personatus*.

Reduvius guttatus Walk and *R. signifer* Walk. belong in *Homalocoris* and *Leogorrus* respectively.

19. SPINIGER Burm.

Burmeister, (b)234; Am. et S. 234; Stal (f)109, 113; Champion, 202.

(=*Acrocoris* Hahn=*Acidoparius* Stal=*Micracidius* Stal=*Opisthacidius* Berg. =*Pantopsilus* Berg.)

About sixty species have been referred to this genus but they are all confined to Central and South America except four.

a. Anterior lobe of the pronotum armed with two erect spines on the disc.
   b. Scutellum bearing an erect spine.....*spinidorsis*
   bb. Scutellar spine oblique.....*limbatus*
aa. Anterior lobe of pronotum unarmed; scutellum bearing an oblique spine.. *arizonica*

S. ARIZONICA *Banks* (b) is a recently described species from Arizona. It is a shining deep black in color and 22 mm. long.

S. SPINIDORSIS *Gray* (=*flavipennis* Mayr=*flavispinis* Stal) is found in Yucatan. The scutellum bears a long erect spine; the pronotum bears a long spine at each of the posterior angles and a small tubercle on each side.

S. LIMBATUS *Lep. et Serv.* (=*circumcinctus* Hahn) occurs in Mexico and the West Indies. The spine on the scutellum is only semi-erect; a short spine is found at the sides of the anterior lobe of the pronotum and the hind angles of the latter are acutely dilated.

S. BICOLOR *Stal* (Stett. Ent. Zeit., 1859, p. 396; Berl. Ent. Zeit., 1869, p. 234). Banks (c) records the presence of this form in Texas and Arizona. It is distinguished from the other species by having the posterior lateral angles rounded and unarmed and by possessing on the anterior lobe of the pronotum four small tubercles, the lateral two of which are minute.

20. MACROPHTHALMUS Laporte

Lap. 11; Stal, (f)109, 113; (*Macrops* Burm. 232; Am. et S. 342; Stal (b)121, (g)456; Walker, viii, 11)

This genus requires a new name, Laporte's being preoccupied in Crustacea and Burmeister's in Reptilia. "These insects live under the bark of decaying trees, in forest clearings, and prey on freshly emerged Coleoptera, etc." (Champion, 205)

M. HISTRIONICUS *Stal.* Mexico and southward. Jugae very prominent, oblique, subconical, more or less uniting at base and together forming a broad, bifurcate elevation; body elongate.

M. PALLENS *Lap.* Mexico and southward. Jugae not prominent; body rather short; corium with a narrow transverse black fascis before the apex.

21. CONORHINUS Laporte

Stal, (e)123; Uhler 284; Champion 206; (=*Triatoma* Laporte.)

Several species of Conorhinus are well known in America and have a wide distribution. Their bite is dangerous. Both generic and specific characters in this paper are adapted from Stal, except for the first three species from Uhler and for minor additions from Champion. The key is unsatisfactory in the characters *b.* and *bb.* where it is a literal translation from Stal (e). In the absence of any named specimens of the group *bb.*, however, I am unable at the present time to improve it.

North American species all have joint 1 of the rostrum longer than or subequal in length to that part of the head in front of the antennae; antenniferous tubercles unarmed externally at the apex and the ocelli on very slightly elevated tubercles.

a. Surface of pronotum and prosternum more or less granular.
  b. Smoke-brown in color, base of pronotum and outer part of connexium red; rostrum brown banded with white; scutellum flat; pronotum obsoletely rugose; about 20 mm. long.....1. *rubidus* Uhl.
  bb. Piceous or nigro-fuscous; pronotum not marked with red; rostrum without white bands.
    c. Juga and tylus separated by terminal notches; rostrum barely reaching prosternum; about 35 mm. long.....2. *maximus* Uhl.
    cc. Juga and tylus not distinctly separated terminally; less than 25 mm. long.
      d. Eyes small; head black; body very narrow, one-fifth as wide as long; rostrum reaches middle of prosternum.....
      3. *protractus* Uhl.
      dd. Eyes large; head fuscous; body at least one-fourth as wide as long.....4. *rubrofasciatus* DeG.
aa. Pronotum and prosternum destitute of granules.
  b. Border of abdomen of one color (black or fuscous), segments of border, narrowly at base, broadly at the apex, bordered with reddish brown; clavus, except at the extreme base, fuscous or black.
    c. Rostrum slender; joints 1 and 2 slightly pilose, 2 more than twice as long as 1; tubercles at the apical angles of the pronotum slightly acute, conical .....5. *sanguisugis* LeC.
    cc. Rostrum entirely pilose, joint 2 a third longer than joint 1, joint 1 much longer than joint 3; tubercles at the apical angles of the pronotum slightly elevated, obtuse.....6. *variegatus* Drury
  bb. Base of the border of the abdominal segments fuscous or black or with black spots.
    c. Broad border of the abdomen yellowish or light brown marked with a black spot at the base of each segment.
      d. Black spot on the disc of the corium small or obsolete.....
      7. *dimidiatus* Latr.
      dd. Disc of the corium with a broad, more or less interrupted black fascia.....8. *maculipennis* Stal
    cc. Border of the abdomen entirely black except for a narrow yellowish spot at the apex of one segment.....9. *gerstaeckeri* Stal

1. C. RUBIDUS *Uhler.* Lower California.
2. C. MAXIMUS *Uhler.* Lower California.
3. C. PROTRACTUS *Uhler.* California.
4. C. RUBRO FASCIATUS *DeGeer* (=*stalii* Sign.=*gigas* Fabr.=*erythrozonias* Gmel.) is distributed throughout North and South America, Asia and Africa as far north as the latitude of Kansas and China.
5. C. SANGUISUGIS *LeC.* (=*lateralis* Stal). Maryland to Illinois and south to Florida, Texas and Central America.
6. C. VARIEGATUS *Drury* (=*claviger* Gmel.=*lecticularis* Stal=*lenticularis* Stal). Georgia, Illinois, Texas, California.

7. C. DIMIDIATUS *Latr.* Mexico.

8. C. MACULIPENNIS *Stal* is called a variety of *C. dimidiatus* Latr. by Champion. Mexico.

9. C. GERSTAECKERI *Stal.* Texas.

22. MECCUS Stal

Stal, (f)109; Champion, 209.

This is a genus of very large insects resembling Conorhinus but distinguished from the latter by the longer post-ocular portion of the head and the more prominent pronotal tubercles. Champion separates the species as follows:

a. Hind angles of the pronotum obtuse.

bb. Corium with the base broadly and an ante-apical fascia ochreous, the membrane and the apical half of the clavus fuscous..... 1. *phyllosoma* Burm.

bb. Corium except at apex and at base of outer margin, apical half of clavus and basal margin of the membrane, dirty white..... 2. *pallidipennis* Stal.

aa. Hind angles of pronotum acute; corium with base, an ante-apical fascia and the outer margin beyond the middle, ochreous..3. *mexicanus H.*-Sch.

1. M. PHYLLOSOMA *Burm.* (246) California and Mexico.

2. M. PALLIDIPENNIS *Stal* (f, 110). Mexico.

3. M. MEXICANUS *H.-Sch.* (viii, 71). Mexico.

23. RHODNIUS Stal

Stal, (f)108, 110, (e)123.

No species are found on the continent.

R.PROLIXUS *Stal* (*limosus* Walk.) occurs in the West Indies. Its description may be found Berlin Entom. Zeitschrift, iii, 104. (1859).

Subfamily **PIRATINAE**

24. THYMBREUS Stal

Stal. (b)113, (f)105, 109. (*Opinus* Walk.)

A little known genus of which one species occurs in Mexico.

T. CROCINOPTERUS *Stal* (=*Pirates semirufus* Walk.) Mexico. Lengtb about 11 mm. Clavus and corium white, membrane dark colored. Legs stout, setose. Pronotum piceous or fuscous.

25. TYDIDES Stal

Stal, (b)113, (f)105, 108; Champion, 213.

A monotypic tropical American genus.

T. RUFUS *Serv.* (=*brachiatus* Perty=*sulcicollis* Uhler). Found in considerable numbers in southern Mexico. Pronotum and clavus flavescent, latter with a dark spot, corium fuscous. Length about 18 mm.

26. MELANOLESTES Stal

Stal, (f)105, 107; Champion, 213.

The first two species of this genus are common under stones and rubbish in the Atlantic coast and Gulf regions of the United States. They are active and bloodthirsty insects and inflict a severe wound (Uhler, Howard).

1. M. PICIPES *H.-Sch.* is black with piceous legs and antennae. It as well as *M. abdominalis* has the inter-ocular part of the head broader than the eyes as seen from above. Illinois to Atlantic coast.

2. M. ABDOMINALIS *H.-Sch.* has the sides and sometimes the whole dorsal surface of the abdomen red. Illinois and southward.

3. M. MORIO *Erichs.* (*Pirates picipes* Walk.) has larger, less widely separated eyes in the male so that the inter-ocular part of the head is narrower than the dorsal aspect of the eye. Mexico.

4. M. DEGENER *Walk.* (*Pirates degener* Walk) is very similar to *M. morio* and occurs in the same locality.

27. RASAHUS Am. et S.

Am. et S., 325; Stal, (f)105; Champion, 214.

(=*Callisphodrus* Stal=*Macrosandalus* Stal=*Sphodrocoris* Stal.)

The species of this genus are large conspicuously colored insects of wide distribution. Those in North America are not pubescent but have long scattered hairs on the head and pronotum. Champion separates the species as follows:

a. Pronotum almost smooth, the anterior lobe with the median sulous only distinct, the other sulci obsolete except at the sides in front; elytra with the base and apex of the corium broadly, a common patch joining the apex of the scutellum, a transverse mark below the base of the membrane extending down along the inward margin and a large patch at the apex, sordid white, the pale portions of the corium often reddish; size large.... 1. *albomaculatus* Mayr

aa. Pronotum with seven more or less distinct sulci.

b. Pronotum shining, sulci deep, posterior lobe faintly rugulose in front.

c. Costal margin of hemelytra pale at base.

d. No transverse vitta at base of membrane....2. *biguttatus* Say

dd. Transverse pale vitta at base of membrane..3. *sulcicollis* Serv.

cc. Costal margin of hemelytra black to base; elytra with a narrow ochreous patch on corium and clavius.....4. *hamatus* Fabr.

bb. Pronotum opaque; all but median sulci shallow and granulate..... 5. *guttatipennis* Stal.

1. R. ALBOMACULATUS *Mayr* (=*Pirates hamifer* Walk.=*Lestomerus tuberculatus* Fallou). Mexico.

2. R. BIGUTTATUS *Say* (307, 358), (=*mutillarius* Guer.=*thoracicus* Stal) is found in the southern United States and is common in Mexico. There is great variation in color.

3. R. SULCICOLLIS *Serv.* (=*spheginus* H.-Sch.). Mexico.

4. R. HAMATUS *Fabr.* (=*mutillarius* Fabr.=*uncinatus* Gmel.) Walker has described this species four times in the genus *Pirates*, calling it: *maculipennis, indecisus, concisus*, and *contiguus;* and Fallou has used the names: *Pirates sipolisii* and *Lestomerus varipes.* Mexico.

5. R. GUTTATIPENNIS *Stal* (=*Pirates mexicanus* Walk.). Mexico.

28. SIRTHENIA Spinola

Spinola, 100; Stal, (b)113, (f)104, 105; Champion, 220.

S. STRIA *Fabr.* (=*carinatus* Fabr.=*roseus* H.-Sch.) is a conspicuous species ranging south from Carolina, Illinois and California throughout the Americas.

Subfamily **ECTRICHODIINAE**

29. POTHEA Am. et S.

Am. et S., 344; Stal, (b)102, (f)101, 103; Champion, 221.

These are rare insects confined to America. They may be recognized by the elongate post-ocular portion of the head and its cylindrical posterior portion. The first joint of the rostrum is longer than the other two put together. In North American species the elytra are fuscous or flavescent and the anterior femora show a sinuous dorsal margin.

P. AENEO-NITENS *Stal.* Tylus unarmed in the male; ocelligerous tubercles very obtuse, lower than the inter-ocular part of the head. Southern states.

P. MACULATA *Champion.* Tylus cariniform; ocellar prominences moderately raised; head comparatively short, shorter than the pronotum. The single specimen was found in Mexico.

30. ECTRICHODIA Lep et Serv.

Lep. et Serv., 279; Stal, (f) 101, 102; Champion, 224; (*Rhiginia* Stal, (b) 102).

An American genus each of whose species shows much color variation. Those north of Panama have a smooth posterior lobe of the pronotum and straight tibiae.

1. E. CINCTIVENTRIS *Stal.* Legs black or piceous; dorsal surface of head, base of the hemelytra, dorsal disc and margin of the abdomen, sometimes also disc or discoidal spots on the venter, yellowish. Eyes of the male prominent; post-ocular portion of the head shorter than in other species; tylus somewhat elevated. Texas and Mexico.

2. E. CRUDELIS *Stal* (=*ruficollis* Stal=*crucifera* Stal=*fervida* Walk.) Legs and body black; two inter-ocular spots and ocellar tubercles a dirty yellow; tylus not much elevated; thorax with a black cruciform impression on the reddish pronotum, posterior lobe of pronotum sometimes subrugose. Mexico.

3. E. CRUCIATA *Say* (=*bicolor* H.-Sch.=*media* Walk.) Legs pale except for apex of femora; elytra short and fuscous; post-ocular portion of the head broad; eyes small. Pennsylvania to Mexico.

Subfamily **HAMMATOCERINAE**

31. HAMMATOCERUS Burm.

Laporte, 79 (*Hammaccrus*); Burmeister, 235; Stal (f)100; Champion, 226.

This is an American genus whose species have many color varieties. Those in our range have most of the corium and clavus a dirty white and the anterior femora armed with a spine near the apex.

H. PURCIS *Drury* (=*nychthemerus* Burm.=*furcis* Blanch.) is found throughout the southern United States. All or only the posterior femora are rufous at the base.

H. LUCTUOSUS *Stal* from Mexico has all the legs black and has a rod shaped black spot at the base of the corium. Both species are large insects varying from 21 mm. to 28 mm.

32. HOMALOCORIS Perty.

Perty (175, *Platycoris*), 216; Stal (f)100; Champion, 227.

The second antennal joint is divided into many small jointlets but the abdomen does not have a densely pilose ventral spot. The following is adapted from Champion:

a. Legs annulate; pronotum with lateral margins ochraceous; second antennal joint divided into eight jointlets.....1. *varius* Perty

aa. Legs black; second antennal joint divided into 13 to 18 jointlets.

b. Corium flavous or ochraceous with a median large oblong black spot; membrane pale at apex.....2. *maculicollis* Stal

bb. Corium and membrane black, corium with a small spot at base; pronotum with two small ochreous spots on posterior lobe in front....3. *guttatus* Walk.

1. H. VARIUS *Perty* (=*Cethera annulipes* Stal) Mexico and South America.
2. H. MACULICOLLIS *Stal*, Western United States, Mexico, Costa Rica.
3. H. GUTTATUS *Walk.* Mexico.

Subfamily APIOMERINAE

33. APIOMERUS Hahn

Stal (f)95; Champion, 230; Am. et S., 354 (*Herega*); Stal (e)116 (*Dichrorhabdallus*); Stal (e)117 (*Callibdallus*).

This is a genus including many species with a broad range of territory. Fifteen are recorded from North America but two of them cannot be included in a key. Champion lists all except Nos. 1, 2, 4, 5, and is the authority for most of the characters and the plan of separation used below. Other sources of information I have noted with the discussion of the species.

a. Female with orbicular foliaceous genital appendages; male with two divergent, upwardly curving spines at apex of last genital segment. (*Apiomerus* Hahn). Male claspers slender; sixth dorsal segment of male narrowly dilated posteriorly, truncate or rounded at apex; moderately large species.

b. Pronotum and legs black; corium with a very large ochreous patch..3. *elatus* Stal

bb. Pronotum with an ochreous transverse band; tip of femora and base of tibiae ochreous.....4. *repletus* Uhl.

aa. Female without foliaceous genital appendages.

b. Female with sides of first genital (terminal dorsal) segment forming a. continuous outline with the connexival margin.

c. Male with a single truncate process at apex of last genital segment; body sparsely pubescent.....5. *ventralis* Say

cc. Male with two upwardly curved, more or less divergent spines at apex of last genital segment.

d. Membrane infuscate.

e. Male with the two spines at the apex of the last genital segment strongly divergent, arising from a short broad process, the apical margin of this segment not toothed nor angulate at the sides above the insertion of the claspers and the process not truncate; corium usually piceous.....6. *subpiceus* Stal

ee. Male with the two spines at the apex of the last genital segment not arising from a short process.

f. Apical margin of terminal genital segment appearing emarginate on each side above the insertion of the claspers.

g. Spines long, strongly divergent; membrane mottled; body robust, elongate.....7. *tristis* Champ.

gg. Spines shorter and feebly divergent, widely separated at base; membrane spotted or unicolorous; body rather short.....8. *immundus* Berg.

ff. Apical margin of terminal genital segment not toothed or angulate at sides above insertion of claspers.

g. Spines very long, acuminate and divergent; elytra moderately long, corium and membrane dark; body robust .....9. *longispinis* Champ.

gg. Spines much shorter, divergent; elytra much longer than abdomen with basal nervures yellow.....10. *moestus* Stal

dd. Membrane hyaline, only the base dark, corium blackish, nervures partly or entirely pale; abdominal margin emarginate (as in No. 7).....11. *venosus* Stal

bb. Female with outer apical angles of first genital segment deflexed and not forming a continuous outline with the connexival margin; male with apex of last genital segment produced into a short process in the center and armed with two spines. (*Herega* Am. et S.)

c. Male with two genital spines upwardly curved and obliquely divergent.

d. Pronotum partly rufous; basal margin narrowly pale; abdominal margins at most very narrowly pale....12. *spissipes* Say

dd. Pronotum black with reddish or pale basal margin; abdominal margins more broadly pale; corium dark red.....13. *crassipes* Fabr.

cc. Male with the two genital spines horizontal, short and stout, laterally extended; venter flavous.

d. Large, brightly colored species, with ventral segments narrowly black .....14. *flaviventris* H.-Sch.

dd. Smaller species with broader black bands on ventral segments 15. *pictipes* H.-Sch.

1. APIOMERUS BURMEISTERI *Guer.* from Cuba, is nowhere described by Stal.

2. A. RUFIPENNIS *Fallou* cannot be identified from his description as only color is mentioned and the variation makes that valueless in this genus. It is probably a variety of A. crassipes or spissipes. (Champion, 296).

3. A. ELATUS *Stal.* Mexico and Costa Rica.

4. A. REPLETUS *Uhler* (=*occidentalis* Glover) is found in the western United States and Mexico. The above characters are from specimens at Iowa State College collected in Vera Cruz, Mexico.

5. A. VENTRALIS *Say* (355) is recorded by Say and Uhler from Missouri, Nebraska and westward to California. Three specimens at Iowa State College gave the characters used in the key. The two females agree with each other in genitalia but only one of the three, a male, answers Say's color description.

6. A. SUBPICEUS *Stal.* Mexico.

7. A. TRISTIS *Champion.* Mexico.

8. A. IMMUNDUS *Berg.* Mexico.

9. A. LONGISPINIS *Champion.* Mexico.

10. A. MOESTUS *Stal.* Mexico.

11. A. VENOSUS *Stal.* Mexico.

12. A. SPISSIPES *Say.* Arizona, Colorado, Texas, Mexico, and Costa Rica.

13. A. CRASSIPES *Fabr.* (=*linitarius* Say=*rubrolimbata* Am. et S.) Canada and South Carolina to Nebraska and Texas; south into Mexico. Color fairly constant.

14. A. FLAVIVENTRIS *H.-Sch.* Texas to California and Mexico.

15. A. PICTIPES *H.-Sch.* Mexico and Costa Rica.

Subfamily **ZELINAE.**

34. PSELLIOPUS Berg.

Bergroth (a)112; Stal (a)61; (f)69, 86, (*Milyas*, preoc.) Champion, 244. (*Milyas*).

In addition to the characters given in key the members of this genus may be distinguished by the following points. The hemelytra scarcely reach the apex of the abdomen; the first joint of the antenna is shorter than the head and thorax together; the scutellum is distinctly foliaceous at the apex; the lateral angles of the thorax are armed with a little spine or tooth.

Only three species occur north of southern Mexico; they may be separated as follows:

a. Anterior lobe of pronotum with eight long erect spines, the posterior lobe armed with numerous short spines; apex of scutellum narrow..... 1. *punctipes* Am. et S.

aa. Lobes of pronotum without erect spines; joint 1 of antennae whitish at apex; apex of scutellum broad, sometimes broadly foliaceous.

b. Joint 1 of antennae without four whitish rings; male without sulcate spine at the apex of the last genital segment.....7. *cinctus* Fabr.

bb. Joint 1 of antennae with four whitish rings, male with apex of last genital segment produced in the middle and armed with a long sulcate spine.....5. *zebra* Stal

Champion named eight new species from Southern Mexico and Central America. One of these occurs only beyond the limits of the territory with which this paper is concerned. His complete key, after adding *P. cinctus* Fabr. and omitting *P. infuscatus* Champ. would read as follows:

a. Femora speckled and annulated with black; posterior lobe of pronotum, tuberculate or granulate.

b. Lateral angles of pronotum with a long spine, the anterior lobe with eight long spines; form elongate, narrow.....1. *punctipes* Am. et S.

bb. Lateral angles of pronotum with a short, stout, backwardly directed tooth; form rather short and broad.

c. Anterior lobe of pronotum with twelve short spines; antennae with joints 2 and 3 subequal in length.....2. *spinicollis* Ch.

cc. Anterior lobe of pronotum simply tuberculate; antennae with joint 3 longer than joint 2.....3. *tuberculatus* Ch.

aa. Femora simply annulated with black.

b. Lateral angles of the pronotum tuberculate or nodose, anterior angles with a short tooth; base strongly bisinuate in the middle; scutellum broadly foliaceous at the apex.....4. *inermis* Ch.

bb. (See also bbb.) Lateral and anterior angles of the pronotum each with a short tooth; the base feebly bisinuate or subtruncate in the middle; scutellum broadly foliaceous at the apex.

c. Male with apex of last genital segment produced in the middle and armed with a long sulcate spine; the genital lobes narrow; head with a pale spot between ocelli.

d. Pronotum with the posterior lobe reddish or stramineous or with spots of that color; the tooth at the lateral angles black.. 5. *zebra* Stal

dd. Pronotum rufous, the tooth at the lateral angles included, the basal margin pale.....6. *rufofasciatus* Ch.

cc. Male without a sulcate spine at the apex of the last genital segment 7. *cinctus* Fabr.

ccc. Male with apex of last genital segment not produced in the middle, armed with a short, slender, sulcate spine.

d. Head with a pale spot between the ocelli; male with the genital lobes strongly clubbed at the tip.....8. *mexicanus* Ch.

dd. Head with a pale spot between the ocelli and a pale medium line extending from it to the base; male with the genital lobes very slender.....9. *lineaticeps* Ch.

bbb. Lateral angles of pronotum with a rather long, outwardly directed spine, anterior angles with a long tooth, base subtruncate in middle; scutellum narrowly foliaceous.....10. *nigropictus* Ch.

1. PSELLIOPUS PUNCTIPES Am. et S. California.
2. P. SPINICOLLIS *Champion.* Mexico, California.
3. P. TUBERCULATUS *Champion.* Mexico.
4. P. INERMIS *Champion.* Mexico.
5. P. ZEBRA *Stal.* California and Mexico. (=*Harpactor cinctus* Walk.)
6. P. RUFOFASCIATUS *Champion.* Mexico.
7. P. CINCTUS *Fabr.* (=*praecinctus* Guer.) Massachusetts to Texas.
8. P. MEXICANUS *Champion.* Mexico.
9. P. LINEATICEPS *Champion.* Mexico.
10. P. NIGROPICTUS *Champion.* Mexico.

35. ZELUS Fabr.

Fabricus (b)281; Stal (f)70, 88; Am. et S. 368, 370; Champion, 251.

This is an American genus occurring throughout the hemisphere. It includes *Euagoras* Burm. (=*Evagoras* Am. et S.), *Diplodus* Am. et S., and *Pindus*, Stal. Many of the species are very variable in color and in other characters usually used for identification. The subgenera are distinguished in the Key to Genera, pp. 7 and 8. In the following key to the species, Champion is responsible for the method of identification of about half of the species, Stal for about one-third, and specimens at Iowa State College for several entirely and many others in part.

Subgenus ZELUS Fabr., Stal.

Lateral angles and disc of the pronotum unarmed.

a. Body wholly or partially black; antennae and legs black.

b. Femora with two stramineous rings; those on the anterior pair sometimes obsolete; pronotum with a single black patch on stramineous disc; body robust.....2. *rubidus* Lep. et Serv.

bb. Femora entirely black.
c. Coxae and trochanters black; abdomen without black fascia..... 3. *mactans* Stal
cc. Coxae and trochanters rufous.
d. Head with two longitudinal black stripes on the post-ocular portion.....4. *bilobus* Say
dd. Head entirely stramineous.....5. *longipes* Linn.
aa. Entire body, antennae, rostrum and legs, pallid; body narrow.
b. Head elongate, gradually narrowed toward base.
c. Legs speckled or annulated with black.....6. *pictipes* Champ.
cc. Legs entirely pale.....7. *cervicalis* Stal
bb. Head comparatively short, strongly narrowed toward the base..... 8. *pallens* H.-Sch.

Subgenus *Diplodus* Am. et S.

Lateral angles of pronotum armed with a spine or tooth; disc unarmed.
a. Head rufous or sanguineous; pronotum with one or two transverse black fascia; legs partly testaceous or sanguineous; body more or less robust.
b. Lateral spines of pronotum sharp; femora testaceous at base..... 9. *ruficeps* Stal
bb. Lateral spines of pronotum very short or indistinct; femora at base and abdomen more or less sanguineous.....10. *grassans* Stal
aa. Head testaceous or stramineous, usually with darker markings.
b. Anterior lobe of pronotum with numerous black spots on the disc, separated by sinuous line of pubescence; size large.....11. *janus* Stal
bb. Anterior lobe of the pronotum without black spots on the disc.
c. Pronotum sulcate down center, from apex to middle of posterior lobe.
d. Body robust, four or five times as long as wide; anterior femora incrassate; all femora thickened; transverse black fascia on the abdominal segments; joint 1 of antennae as long as head and thorax together .....12. *sulcicollis* Champ.
dd. Femora slender, anterior not incrassate; posterior lobe of pronotum with a shallow lateral sulcus on each side.
e. Body slender, over six times as long as wide; joint 1 of antennae as long as head and pronotum together; a Cuban species.....13. *subimpressus* Stal
ee. Body slender; joint 1 of antennae shorter than head and pronotum together; a Californian species..14 *renardii* Kol.
cc. Pronotum with anterior lobe only sulcate; body moderately broad or narrow; head, pronotum and scutellum testaceous, fuscous or nigrofuscous; femora sometimes with a darker ring at apex.
d. Lateral angles of pronotum armed with a rather stout acute spine, the posterior lobe rugulose.....15. *exsanguis* Stal
dd. Lateral angles of pronotum armed with a short tooth; posterior lobe almost smooth.....16. *laevicollis* Champ.
ddd. Lateral angles of pronotum armed with a short slender spine, posterior lobe rugulose.
e. Legs pale.....17. *nugax* Stal
ee. Legs darker and more slender.....18. *mimus* Stal

Subgenus PINDUS Stal.

Lateral angles of pronotum armed with a sharp spine, the disc with two spines.

a. Anterior lobe of pronotum piceous, posterior stramineous..19. *socius* Uhler

aa. Both lobes of pronotum piceous.....20. *tetracanthus* Stal

1. ZELUS PHALANGIUM *Fabr.* seems to remain unknown. It is not completely recognizable from the description but seems to be related to *Z. longipes* and *bilobus*, differing from them in the immaculate elytra. The description in Fabricius, (a) 196, is as follows: "Rufous, with black antennae and legs. Related to *Z. longipes* Linn. and about the same size; head rufous with two vertical fuscous lines; antennae long, black; rostrum black, rufous at the base; thorax rufous, fuscous above; elytra rufous, immaculate; legs long, black. Habitat in American islands."

2. Z. RUBIDUS *Lep. et Serv.* (=*speciosus* Burm=*tricolor* H.-Sch.=*longipes* Stal. Walk.=*Velia agavis* Blaquez=*stolli* Leth. et Serv.) Texas, Mexico, Antilles and South America.

3. Z. MACTANS *Stal.* Cuba.

4. Z. BILOBUS *Say.* Carolina to Texas.

5. Z. LONGIPES *Linn.* (=*macropus* Gmel.) West Indies.

6. Z. PICTIPES *Champion.* Mexico.

7. Z. CERVICALIS *Stal.* Carolina and Florida to Texas, California and Mexico.

8. Z. PALLENS *H.-Sch.* Mexico.

9. Z. RUFICEPS *Stal.* Mexico and southward.

10. Z. GRASSANS *Stal.* Mexico and Guatemala.

11. Z. JANUS *Stal.* (=*litigiosus* Stal.) Mexico, etc.

12. Z. SULCICOLLIS *Champion.* Mexico.

13. Z. SUBIMPRESSUS *Stal.* West Indies.

14. Z. RENARDII Kol. California.

15. Z. EXSANGUIS *Stal* (=*luridus* Stal=*ambulans* Stal=*cognatus* Costa.) North Carolina to Colorado, California and southward.

16. Z. LAEVICOLLIS *Champion.* Mexico and Texas.

17. Z. NUGAX *Stal.* Mexico.

18. Z. MIMUS *Stal* (=*umbratilis* Stal). Mexico.

19. Z. SOCIUS *Uhler.* Idaho, Dakota, Kansas, Arizona and Illinois.

20. Z. TETRACANTHUS *Stal.* Mexico.

Specimens of the following three species were impossible to obtain and their descriptions are of little taxonomic value.

21. Z. MARGINATA *Provancher* (a), recorded from Ottawa is incompletely described but traces to *Z. cervicalis* Stal. It is almost certainly a synonym of the latter species.

22. Z. FEROX *Banks* (b), from Arizona, is discussed as *Castolus ferox*, q. v.

23. Z. AUDAX *Banks* (b) has ben found in New York and Virginia. Banks suggests that it is related to *Z. socius* Uhler. Brownish yellow; no tubercles over base of antennae; posterior lobe of pronotum with middle and lateral depressions, the ridges terminating behind in four large conical tubercles.

36. DARBANUS Am. et S.

Am. et S., 370; Provancher, 183.

VanDuzee who has recently had an opportunity to examine the Provancher collection of Hemiptera, publishes his conclusions in the Canadian Entomologist, Nov., 1912. He says the Provancher's specimens of *Darbanus palliatus* Prov. and *D. georgiae* Prov. are both "*Diplocodus luridus* Stal" (listed above as *Zelus exsanguis*) and that *Zelus marginata* Prov. is, as suggested above, *Z. cervicalis* Stal. The former opinion disregards without explanation Provancher's separation of these species from "*Diplodus*" on the basis of the armature of the pronotum. Should these species still prove to be valid they should be placed as a subgenus of *Zelus*, distinct from the subgenera given above.

37. NOTOCYRTUS Burm.

Burmeister, 227; Stal (f) 69, 84; Champion, 262.

The species of this genus may be recognized by the inflated posterior lobe of the pronotum which covers both the anterior lobe and the scutellum. Only one North American species is reported.

N. DORSALIS *Gray*, var. DROMEDARIUS *Stal* (=*N. vesiculosus Perty*). Head with two long spines; pronotum with posterior lobe greatly inflated, emarginate in front, produced laterally into a curved horn-like process and strongly depressed on the disc before and behind the middle. In the variety the pronotum is entirely black and is not, as in the more southern varieties, marked to some extent, with yellow. Mexico.

38. DEBILIA Stal.

Stal (f) 68, 84; Champion, 265.

D. RUFESCENS *Champion*. Mexico. Eyes small in males; body slender, vermilion red; segment 6 armed laterally with a long spine.

39. RICOLLA Stal.

Stal (f) 68, 77; Champion, 266.

A tropical American genus with bispinous knees and the first five (six in the female) abdominal segments armed with a spine at the outer apical angles.

R. SIMILLIMA *Stal*. Mexico, Central America and Costa Rica. May be separated from a nearly related species (*R. pallidipennis*) by the lack of a conical tubercle at each of the anterior angles of the pronotum.

40. REPIPTA Stal.

Stal (f) 69, 80; Champion, 267.

An American genus very closely related to the two preceding genera and the one following. The four North American species may be separated as follows:

a. Head with two short spines or tubercles.
   b. Legs unicolorous, black; corium, clavus and rostrum black are blackish; size large.....1. *fuscipes* Stal
   bb. Legs sanguineous, annulated with black; corium and clavus partly fuscous; size small.....2. *nigronotata* Stal

aa. Head with two long spines.
   b. Legs black, except femora sometimes at base; posterior lobe of 16

pronotum mostly black .....3. *taurus* Fabr.

bb. Legs and pronotum pale, pronotum sometimes with two black vittae 4. *flavicans* Am. et S.

1. R. FUSCIPES *Stal.* (=*Isocondylus fuscipes* Stal) is common in western Mexico, scarcer southward.

2. R. NIGRONOTATA *Stal.* Mexico.

3. R. TAURUS *Fabr.* (=*Zelus lineatus* Am. et S.) is found north as far as Philadelphia and is common in Texas, Mexico, South America, and the West Indies. The pronotal spines are very long.

4. R. FLAVICANS *Am et S.* (=*Zelus flavicans* Am. et S.=Z. *lateralis* H.-Sch.=*ochraceus* H.-Sch.=*varipes* H.-Sch.) Common in Mexico and South America. South of Mexico it is more often seen than *R. taurus.*

Mr. Hart has found this species in Illinois.

41. ROCCONOTA Stal.

Stal (f) 69, 79; Champion, 272.

Champion considers this genus as doubtfully separable from Repipta. He gives half a dozen more or less valuable characters as distinguishing points. Four species occur within the limits of the territory covered by this paper.

a. Scutellum raised along the middle posteriorly, postscutellum more or less produced at the apex, not clothed with agglutinated tomentum.

b. Anterior lobe of pronotum with two prominent conical tubercles; abdominal segments one and two spinous at outer apical angles..... 1. *rufotestacea* Champ.

bb. Anterior lobe of pronotum unarmed.

c. Abdomen with first segment only spinose; body closely pubescent beneath apex in spots.....2. *annulicornis* Stal

cc. Abdomen unarmed at the sides; scutellum produced into an upwardly curved spine.....3. *tuberculigera* Stal

aa. Scutellum flattened; postscutellum not produced at apex, clothed with a dense, white agglutinated tomentum; anterior lobe of pronotum with two prominent conical tubercles; abdominal segments 1 to 4 strongly spinose at outer apical angles.....4. *octispina* Stal

1. R. RUFOTESTACEA *Champion.* Mexico.

2. R. ANNULICORNIS *Stal.* Texas to Lower California and south. Stal called this insect Heza but the lack of a tubercle on the mesopleura causes Champion to change this placing.

3. R. TUBERCULIGERA *Stal.* Mexico.

4. R. OCTISPINA *Stal.* Mexico. This species "should perhaps be separated from the genus, it having a differently formed scutellum."—Champion.

42. FITCHIA Stal.

Stal (f) 79.

The two species of Fitchia are only found north of Mexico and east from Texas. The winged individuals of the two species are very similar, differing in the pronotal spines.

1. F. SPINOSULA *Stal.* Texas and eastward. Pronotum armed on the posterior lobe with two short spines on the disc and with a spine at each of the lateral angles.

2. F. APTERA *Stal* (=*nigrovittata* Stal). New Jersey to Colorado and Texas. Pronotum unarmed. Both apterous and winged forms known. There is a conspicuous black vitta on the median dorsal part of the abdomen in this form.

43. SOSIUS Champ.

Champion, 275.

Sosius approaches *Rocconota* but differs in the acutely angled, foliaceous plate-like dilatation of the fifth and sixth abdominal segments. Monotypic.

S. FOLIACEUS Champion. Mexico. Spines on the upper part of the head long and curved forward; those on the genae short.

44. CASTOLUS Stal.

Stal (f) 69, 80; (=*Spinda* Stal); Champion, 278.

This is a tropical American genus, the five species of which may be separated as follows:

a. Lateral angles of pronotum unarmed and not dilated.
   b. Entire head, (or at least the post-ocular portion in one variety) rufous above; no red on elytra; femora orange in color; tibiae black..... 1. *plagiaticollis* Stal
   bb. Head black; margins of elytra rufous; basal half of femora flavous, tip and entire tibiae black.....2. *tricolor* Champ.

aa. (See also aaa.) Lateral angles of pronotum armed with a tooth.
   b. Lateral pronotal angles with a very short tooth; three black spots on yellow pronotum.....3. *trinotatus* Stal
   bb. Lateral pronotal angles with a rather long, stout, tooth; elytra and disc largely fuscous; no black spot on posterior lobe of pronotum.... 4. *subinermis* Stal

aaa. Lateral angles of pronotum subangularly dilated, caudal and lateral margins sanguineous; legs black or brown....5. *rufomarginatus* Champ.

1. C. PLAGIATICOLLIS *Stal.* Mexico.
2. C. TRICOLOR *Champion.* Mexico.
3. C. TRINOTATUS *Stal.* Mexico.
4. C. SUBINERMIS *Stal.* Mexico.
5. C. RUFOMARGINATUS *Champion.* Mexico.

6. C. FEROX *Banks* (b), was described from Arizona as *Zelus ferox.* No characters are given which would place it in that genus. A specimen in the collection of the Illinois State Laboratory of Natural History which answers Banks' description in detail and comes from Arizona is an undescribed species of *Castolus.* Black tubercle over base of antennae, femora with black annulae, body yellow.

45. HIRANETIS Spinola.

Spinola, 112; Stal, (f) 69, 82.

These are slender insects resembling Ichneumon flies, mainly light yellow in color. Seven tropical American species have been described.

H. BRACONIFORMIS *Burm.* (=*pompiloides* Burm.) is a variable species. Femora more or less annulated with black; pronotum varies from flavous to piceous; elytra fuscous with a transverse piceous band midway between base and apex.

46. GRAPTOCLEPTES Stal.

Stal (f) 69, 81.

Another genus showing great color variations. Only one of the nine described species occurs in North America.

G. SANGUINEIVENTRIS *Stal.* Mexico. Some specimens have a large sanguineous patch on the pronotum. Hind femora (sometimes also fore and middle femora) with a pale median annulus.

47. ATRACHELUS Am. et S.

Am. et S. 374; Stal (f) 68, 78; Champion, 283.

Individuals of this genus are among the smallest of the entire family. They may be recognized by the spinose and slightly dilated apical angles of abdominal segments 1-5. The femora are unarmed.

A. CINEREUS *Fabr.* (=*heterogeneus* Am. et S.) is about 7 mm. long and is fuscous in color. The body is rather stout. It is recorded from Philadelphia, Carolina, Texas, Mexico and southward.

48. PLOEOGASTER Am. et S.

Am. et S. 363; Stal (f) 98; (=*Passaleutus* Am. et S.)

No species of this genus have been found on the continent north of Central America.

P. ACANTHARIS *Wolff.* West Indies. Anterior lateral margins of the posterior lobe of the pronotum straight and entire; distinct teeth on apical angles of abdominal segments; apex of all femora and base of tibiae black.

49. HEZA Am. et S.

Stal (f) 68, 75; Champion, 284.

The unarmed fore-femora and the mesosternal tubercle separate this genus from those which resemble it. Five of the seventeen described species are found in this region. The following key includes those of Stal and Champion both with some modifications.

a. Anterior lobe of pronotum bispinous or prominently bituberculate posteriorly; abdomen not perceptibly broadened beyond middle, with subparallel sides; joint 1 of rostrum not longer than the two following joints together.
   b. Only the first segment of the abdomen with a short spine or tooth on the apical angles; joint 1 of antennae not shorter than head, thorax and scutellum together.....1. *similis* Stal
   bb. Several or all abdominal segments armed with a spine on the lateral angles.
      c. Anterior lobe of pronotum armed posteriorly with two short obtuse spines; juga slightly prominent.....2. *pulchripes* Stal
      cc. Anterior lobe of pronotum armed with two long spines; body fuscous; femora and tibae annulated with black.....
      3. *fuscinervis* Champ.

aa. Anterior lobe of pronotum unarmed posteriorly.
   b. Anterior margin obtuse, not produced; apical angles of first five abdominal segments with a rather long spine.....4. *acantharis* Linn.
   bb. Prosternum angularly produced in front; all abdominal segments with

spines at the apical angles; fourth segment with a stout spine; last dorsal segment of female truncate at apex.....5. *clavata* Guer.

1. H. SIMILIS *Stal.* Mexico.
2. H. PULCHRIPES *Stal.* West Indies.
3. H. FUSCINERVIS *Champion.* Mexico and Central America.
4. H. ACANTHARIS *Linn.* West Indies.
5. H. CLAVATA *Guerin.* West Indies.

50. ARILUS Hahn.

Champion 267; Stal (f) 67, 72 (*Prionotus*).

Arilus Hahn=*Prionotus* Laporte=*Prionidus* Uhler, the two latter names being preoccupied.

Species of this genus are easily distinguished by the presence of a high mesal tuberculate ridge on the pronotum.

1. A. CRISTATUS *Linn.* (=*novenarius* Say=*denticulatus* Westw.=*patulus* Walker) New York to California and south. Posterior lobe of pronotum convex and strongly cristate with 8-10 tubercles on the crest; margins of abdomen distinctly sinuate. This is a common insect in the southeastern states.

2. A. DEPRESSICOLLIS *Stal.* Mexico. Posterior lobe of pronotum flattened and feebly cristate; margins of abdomen feebly sinuate.

3. A. CARINATUS *Forst.* (=*serratus* Fabr.=*xanthopus* Walk.) West Indies. 12-14 tubercles are found on the crest of the pronotum; the pronotal margins are distinctly dilated behind the posterior lateral angles.

51. STHIENERA Spinola.

Sthienera Spinola (117); Champion (269); *Piezopleura* Am. et S. (362); *Harpactor* Stal (f. 68, 72; b, 47); *Erbessus* Stal (f. 73).

It differs from other Reduviids in having the anterior tibiae toothed near the apex beneath.

S. RHOMBEA *Erichs.* (=*rhombeus* Stal). Mexico. Pronotum and legs are fuscous, scutellum and elytra flavescent.

Note.—*Harpactor americanus* Bergroth (b) is placed by Bergroth in *Harpactor* Laporte (nec Stal) (=*Reduvius* Fabr., Stal, nec Lamarck.)

This species and consequently the genus were overlooked during the preparation of this paper and are found too late to be discussed.

52. ACHOLLA Stal.

Stal (f) 67, 72, (=*Ascra* Stal); Champion, 289.

All three species of this genus occur in North America.

a. Head elongate, post-ocular portion tumid anteriorly; pronotum broader than in other species, somewhat tuberculate.....1. *multispinosa* DeG.

aa. Head shorter, lateral angles of pronotum obtuse; ante-ocular portion of head and anterior lobe of pronotum with prominent conical tubercles; head not tumid .....2. *ampliata* Stal.

aaa. Head shorter; lateral angles of pronotum rather sharp; ante-ocular portion of head and anterior lobe of pronotum only slightly tuberculate....3. *tabida* Stal

1. A. MULTISPINOSA *DeGeer* is the common North American species. It is very similar to the other two. New England to Nebraska. (=*sexspinosus* Wolff =*subarmatus* H.-Sch.)

2. A. AMPLIATA Stal. Mexico. Rare.
3. A. TABIDA *Stal.* California, Mexico and Central America.

53. SINDALA Stal.

Stal (f) 47; Champion, 290.

This genus differs from its near relative, *Sinea*, in the unarmed anterior tibiae.

1. S. ACUMINATA *Uhler* is the only species recorded from North America. Its description has not been found.

54. SINEA Am. et S.

Am. et S., 375; Stal (f) 67, 70; Champion, 291; Caudell (a), (b).

This is a group of widely distributed forms all but one of which occurs in this territory. Caudell has worked out the synonymy most satisfactorily although Champion's work on the genus is also invaluable. The following is an adaptation from both these authors, omitting a species and a variety listed by Caudell, because they have not been found in North America.

a. Anterior prothoracic lobe armed on the disc with spines.
  b. Posterior prothoracic lobe armed on the disc with sharp spines.
    c. Anterior femora with the terminal spine of the inner inferior row out of alignment, occupying a subdorsal position.10. *complexa* Caud.
    cc. Anterior femora with the terminal spine of the inner inferior row not out of alignment.....5. *integra* Stal.
  bb. Posterior prothoracic lobe unarmed on the disc.
    c. Small tubercle surmounting gibbosities of posterior prothoracic lobe.....2. *undulata* Uhler
    cc. No such tubercle present.
      d. Margins of female abdomen prominently and subangularly undulate; male abdomen variable.....1. *diadema* Fab.
      dd. Margins of abdomen of both sexes usually very slightly undulate, entire or with rounded undulations..11. *confusa* Caud.
aa. Anterior prothoracic lobe armed on the disc with mere tubercles, sometimes acuminate, usually blunt.
  b. Disc of posterior prothoracic lobe bigibbous; abdomen of both sexes abruptly widened behind.....3. *coronata* Stal
  bb. Disc of posterior lobe of pronotum transversely convex; unarmed.
    c. Abdomen narrow in male, widened to apex of fourth segment in female; third spine of ante-ocular series very long..4. *raptoria* Stal
    cc. Abdomen of both sexes widened to apex of fourth segment but narrower in male than female.
      d. Head with the third spine of the ante-ocular series very elongate, much longer than the others.....6. *sanguisuga* Stal
      dd. Head with third spine of ante-ocular series not longer than first and second, first usually longest.
        e. Spines on head much reduced, third usually only a tubercle; abdomen narrowly rounded, lateral angles of pronotum moderately acute .....7. *defecta* Stal.
        ee. Third spine not reduced to a tubercle.
          f. Abdomen with a broad, pale fascia at extremity of each

dorsal segment; lateral angles of pronotum slightly acuminate .....8. *rileyi* Mont.

ff. No pale fascia on abdomen; lateral angles of pronotum more acute than in two previous species; spines on head prominent .....9. *spinipes* H.-Sch.

1. S. DIADEMA *Fabr.* (=*multispinosa* Stal=*hispida* Thumb.=*raptatorius* Say =*celosus* Gmel.) is an inhabitant of the greater part of North America from Quebec to southern Mexico. The individuals vary greatly in size and color.

2. S. UNDULATA *Uhler* may be a variety of *S. diadema* for the males of the two species are inseparable. The color varies greatly. California and Mexico.

3. S. CORONATA *Stal.* California and Mexico. This is the most elongate species of the genus.

4. S. RAPTORIA *Stal.* (=*denticulosa* Stal). California, Texas, Mexico, Costa Rica. Champion is authority for the synonymy of the two species.

5. S. INTEGRA *Stal.* Mexico.

6. S. SANGUISUGA *Stal.* Mexico and Florida.

7. S. DEFECTA *Stal.* Mexico.

8. S. RILEYI *Montandon.* Colorado.

9. S. SPINIPES *H.-Sch.* Texas and eastward. Probably includes *S. rileyi* Mont. as the distinguishing characters are somewhat indefinite.

10. S. COMPLEXA *Caudell* (a) is a western species described from California and Arizona.

11. S. CONFUSA *Caudell* (b) from Arizona has heretofore been confused with *undulata* and *diadema.*

INDEX

"A Systematic Outline of the Reduviidae of North America," pp. 217-247.