

ARADIDAE OF OHIO.*

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The *Aradidae* are a very interesting group of *Hemiptera*, being adapted by their flattened bodies to live under the loose bark of stumps and dead timber.

The species are many of them quite rare and it seems probable that their numbers have diminished rapidly with the deforestation of the region and the destruction and manufacture of the dead timber that constitute their natural habitat. It is of particular interest, therefore, to collect them as carefully as possible since the chance of securing a full knowledge of our local fauna is growing constantly less.

Some of the species seem to show a preference for certain kinds of timber and possibly careful study would show some decided predilection; so far, however, little accurate record has been kept of the kind of bark under which they occur. In many cases, no doubt, the determination of the kind of a tree which has become a rotting log or stump is difficult, but records, whenever possible, would have a distinct interest. *Neuroctenus simplex* Uhler has been taken under the bark of beech at Columbus, but I have specimens from Iowa in a locality where I think the beech does not occur.

Mr. Dury has collected a number of species in sifting dead leaves and forest rubbish in fall and winter.

Our native species are dark brown or black and have wings much reduced in size, the elytra or fore wings covering only the disk of the abdomen. The beak is rather short in some genera—not reaching beyond hind border of head. Our species so far recognized in the State fall into three genera, *Aradus*, *Brachyrhynchus* and *Neuroctenus*, but we most probably have representatives of *Aneurus* also.

These genera are separable as follows:

- A. Hemelytra with distinct veins.
 - a. Prosternum with distinct sulcus. Beak (except in *niger*) reaching or passing prosternum. *Aradus*.
 - aa. Prosternum without sulcus. Beak short, not passing hinder edge of head.
 - b. Abdominal segments without keel between spiracles and lateral margin. *Brachyrhynchus*.
 - bb. Abdominal segments with a distinct keel on marginal space between spiracles and border. *Neuroctenus*.
- AA. Hemelytra without evident veins. *Aneurus*.

ARADUS AEQUALIS SAY.

Aradus aequalis Say. Heterop., Hemip. p. 29 (1831). Coll. Writ., I, 352. Stal. Enum. Hemip. III, p. 136. Uhler Bull. U. S. Geog. and Geol. Sur., I, 321.

Large, dark fuscous, with gray spots, joints 2 and 3 of antennae of very nearly equal length, all joints cylindrical. Length, 10 mm.

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Head a trifle longer than wide, anterior process coarsely granulate, pronotum widening slightly, anterior margin with irregular denticles. Disk with four rough longitudinal elevations on posterior half and two approximate and still more elevated ridges on anterior half. Elytra moderately dilated at base, nearly reaching the tip of abdomen.

Abdomen moderately broad, sides subparallel, appearing somewhat crenulate. Color dark fuscous with grayish suffused spots on sides of pronotum, base of elytra and connexivum, and indistinct annulations on the legs.

This species may be mistaken for *crenatus* Say as it approaches that species in length and has the margin of the abdomen similarly ornamented. It is, however, narrower, the abdomen with sides distinctly fuscous instead of grayish. Say gives the equal length of joints 2 and 3 of the antennae as the distinctive character, but in the specimens in hand I find a slight deviation from an exact equality, the second joint being a trifle longer.

Two specimens collected by Prof. Hine at Cincinnati, also a pair collected by Mr. Dury at same place.

ARADUS CRENATUS SAY.

Aradus crenatus Say. Heterop. Hemip. (1831). Coll. Writ. I, 350. Stal Enum. Hem. III, 137. Osborn. Proc. O. S. A. S. VIII, p. 77.

The largest of our native Aradids, the abdomen broad, the margins crenate. Color grayish brown. Length 11 mm.

Head slightly longer than broad. Anterior process rather slender, antennae, joints 2 and 3 nearly equal, two usually a trifle longer, fourth about two-thirds of three. Pronotum widening anteriorly, anterior margin denticulate, disk with subparallel, elevated granulate ridges. Scutellum elongate, triangular. Elytra expanded at base, distinctly narrower at apex and occupying only the central disk of the abdomen.

Abdomen broad, oval, margin crenate, the posterior lobes rounded behind. Beak reaching the posterior edge of anterior coxae.

Color gray, with light grayish or pallid area on the sides of prothorax, base of elytra and occupying a large part of the exposed portion of the dorsal abdominal segments; beneath gray, the venter suffused with reddish, legs light fuscous with gray annulations.

This elegant species seems to be of rare occurrence, or, at least, it is rarely taken, though from its color it would seem to be fully as conspicuous as many of the other species. It is longer and broader and the abdomen more dilated than *aequalis*. The antennal joints 2 and 3 "sub-equal," according to Say, are in my specimen in proportion of 5 to 6, the second being the longer.

One specimen collected at Columbus, and I have before me one collected at Cincinnati by Mr. Dury.

ARADUS ROBUSTUS UHLER.

Aradus robustus Uhl. Proc. Bost. Soc. Nat. Hist. (1871) p. 104 and (1878) p. 419.

This species is of a dark gray to blackish color, the antennae very robust. Length $5\frac{1}{2}$ - 6 mm.

The head wide, antennae very robust, joint 2 a little longer than joint 3, about equally thick, 4th joint smaller, shorter than third.

Pronotum rounded on the margin, surface coarsely granulate and with four elevated ridges on the disk, the outer ones not reaching the anterior margin. Scutellum with sides parallel at base. Elytra moderately dilated at base, not reaching end of abdomen. Beak reaching middle of mesosternum. Color dull fuscous or blackish, a ring near the tip of tibiae and the base of the tarsal joints slightly paler.

Widely distributed over the United States but has been taken in Ohio only in Columbus and Cincinnati. Other records place it in Iowa, Canada, Mass., N. J., N. Y., Md., Ill., Wis. and Minn.

It is at once separated from other native species with thick antennae by the dull fuscous or blackish color.

ARADUS ORNATUS SAY.

Aradus ornatus Say. Heterop. Hem. (1831), p. 21. Coll. Writ. I, 352. Bergroth, Proc. Ent. Soc. Wash. II, 332 and 335.

Antennae robust, third joint largest, second longest. Rusty brown with yellow spots. Length, male, 5 mm.; female, 6 mm.

Head broad, the antennae much swollen, joint one short, two longest and considerably swollen, three about half as long as two and equally thick, four smaller. Beak reaching to middle of prosternum. Pronotum with lateral borders strongly curved, edge roughened but not dentate, disk with distinct rugosities and three conspicuous glabrous spots on hind border. Scutellum triangular. Base of elytra strongly dilated. Abdomen reddish with pale margin bordered with black. Genital lobes with a transverse light yellow spot.

So far this species has been recorded from Indiana, Pennsylvania, and Cincinnati, Ohio.

A handsome species, described in 1831 from Indiana, and for a long time unrecognized, but Bergroth called attention to it a few years ago, his specimen being credited to Pennsylvania. (Montandon collection.)

Recently Mr. Dury has collected it at Cincinnati and kindly placed three excellent specimens of males and, later, one female in my hands for study. (OHIO NATURALIST, IV, p. 22.)

ARADUS DUZEI BERGROTH.

Aradus duzei Bergroth. Proc. Ent. Soc. Wash. II, p. 333.

Resembles *ornatus* but lacks the polished spots of the hind border of prothorax. Fuscous with light yellowish markings. Length, male, 6 mm.; female, 6.5 mm.

Head broad, antennae robust but less dilated than in *ornatus*, joint two longest, three about two-thirds of two, scarcely as thick.

Margin of prothorax subangulate, the disk with four rough carinae.

Elytra dilated at base, barely reaching tip of abdomen, suffused with yellowish on basal third, membrane brown, veins concolorous.

Color brown. First joint, except at the base, tip of scutellum, margin of abdominal segments and legs, yellow. Tergum and disk of venter suffused with rufous.

This species has been collected at Westerville by Mr. Jas. G. Sanders, and at Cincinnati by Mr. Chas. Dury. It is recorded also for Canada and Pennsylvania by Bergroth, and this author suggests that this species has been mistaken for *ornatus* and so recorded in some earlier papers.

It is a little more slender than that species, the general color more distinctly brown, base of elytra less dilated, and the depressions on the pronotum not polished.

ARADUS DURYI N. SP.

Broad, sides subparallel. Brown with ochery markings. Antennae, joints 2 and 3 nearly equal. Length, female, 9 mm. Width of abdomen, 4 mm.

Head with anterior process much swollen, rounded at apex. Antennae cylindrical, joints of nearly equal diameter, first joint short, barely passing lateral spine and much short of anterior process; two and three almost equal, one side two is slightly longer than three, on the other the reverse. Beak extends to hind border of prosternum. Prothorax broad, lateral angles rounded, anteriorly narrowed; margin reflected, disk with four elevated ridges, the inner ones approximate on anterior half, the outer ones broken before the middle but continued to anterior margin. The carinae are coarsely granulate, the intercarinal spaces smooth but not polished.

Scutellum elongate triangular, margins raised and a median carina on basal half, the margin at base and central carina granulate. Elytra with basal fourth strongly dilated, membrane broad, widening to broadly rounded apex, which reaches nearly half way upon the genital lobes. Abdomen oval, broadly rounded behind, the sides subparallel; genital lobes long, separate, divergent, obliquely subtruncate, the inner angles rounded. Fifth ventral segment as long at margin as on median line, excavated, truncate on median section, sixth segment at middle about one and one-half times longer than fifth, slightly convex and medially notched. Seventh segment half as long as sixth, notched on middle, terminal segment short, subangulate.

Color, ashy brown, with lighter areas on base of wings and veins of corium, and darker fuscous marks and veins on membrane. Antennae yellowish brown, lightest at base, and terminal joint nearly black. The connexiva are brown with posterior border yellowish, and the inner margin of genital lobes of the same color. Beneath rather deeply infuscated, with reddish yellow diffuse spots on the abdomen. The legs yellow with wide fuscous annulations on femur and tibiae, and black tarsal claws.

Described from one specimen, female, from Mr. Chas. Dury, collected at Cincinnati, May 2, 1902.

This species has the general facies of *duzei* though less widened posteriorly, but it is much larger and differs in color of antennae, joints of pronotal carinae, genital segments and other points.

I have named it in honor of Mr. Chas. Dury, who has so generously placed his material in this family at my disposal.

BRACHYRHYNCHUS LOBATUS, SAY.

Aradus lobatus Say. Heterop. Hem. (1831.) Coll. Writ. I, 354.

Brachyrhynchus lobatus Say. Stal. Enum. Hem. III, 145.

Elongate, oval. Black, the pronotum lobate with acute emargination on lateral border and production of anterior angle. Length, male, 7.5 mm—8 mm.

Head as wide as long, anterior process truncate, not incised; antennae slender, joint three longest, one, two and four about equal length, each about two-thirds of three.

Pronotum as wide as base of abdomen, the lateral margin acutely emarginate which, with the projection of the anterior angles, give it a distinctly lobate form; disk coarsely granulate with four distinct elevated ridges on the anterior half.

Originally described from Indiana, this species seems to be rather rare in collections, and in some cases specimens of *granulatus* have stood under its name. It is much larger than that species, as stated by Say, and the deeply indented margin of pronotum separates from any of the other species. I have a specimen from Florida collected by Mrs. Slosson, and Mr. Dury has sent me an example collected at Cincinnati—both males. Bergroth cites its occurrence in Canada, Penn., Md., Mich., Ind., Ill., Mo., Texas and California.

NEUROCTENUS SIMPLEX, UHL.

Brachyrhynchus simplex Uhl. Bull. U. S. Geol. & Geog. Surv. I, 323.

Neuroctenus simplex Uhl. Bergroth Proc. Ent. Soc. Wash. II, p. 336. Osborn Proc. Ohio State Acad. Sci. VIII, p. 77 (record only).

Elongate ovate; black. Surface finely granulate, elytra white. Length, male, 4.5–5 mm.; female, 6 mm.

Head about as broad as long, antennae slender, third joint slightly longer than the others, which are about equal.

Pronotum trapezoidal, the lateral margins sloping towards the head from the basal third, surface granulate, without trace of elevated carinae. Abdomen very flat. Elytra occupying about one-third of dorsal surface.

Color dark brown or black throughout, except elytral membrane, which is white, though sometimes infuscated on central part, and disk of abdomen under the elytra, which is red. Some specimens are less intensely black than the others, but except in immature individuals such cases are rare.

This seems to be our most abundant species, having been taken in large numbers at different points in the State, Columbus, Cincinnati, Williamsburg and Hanging Rock.

It is also widely distributed over the country from New Eng- to Cuba, and west to Iowa, Indian Territory and Texas. Uhler says under bark of oak, but it has been taken here under beech bark also.

NEUROCTENUS OVATUS, STAL.

Mezira ovatus Stal. Stet. Ent. Zeit. XXIII. 339.

Neuroctenus ovatus Stal. Bergroth. Pr. Ent. Soc. Wash. II, 336

Broad ovate, larger, broader than simplex. Black. Length, male, 6 mm.; female, 7 mm. Width of abdomen, male, 3 mm.; female, 3.5 mm.

Head with anterior process deeply cleft, that is, the lateral lobes extending well beyond tylus and not fused. Antennae, joints subequal, third slightly larger than the others. Pronotum slightly sinuate on lateral margin, anterior margin slightly concave, granulate, without carinae. Scutellum triangular, basal margin longest. Elytra with two whitish spots at base of membrane.

Male genital segment oval, broader than long; female genital segment quadrate, the hind border lobate, lateral lobes divergent.

The above description is written for a male and a female collected by Mr. Dury at Cincinnati. While there is a slight difference in measurements and in incision of anterior lobe of head as compared with Stal's description, I believe it should be referred to his species.

The species was described from Mexico by Stal and has been accredited to North Carolina by Bergroth. The specimens collected by Mr. Dury at Cincinnati extends its range to our State. It is similar to simplex except in larger size and broader, more ovate form.

NEUROCTENUS ELONGATUS N.SP.

Elongate, narrowing slightly and anteriorly. Brown. Length of male, 5.5 mm; width of abdomen, 2.25 mm.

Head with anterior process slender, the apex slightly notched. Antennal joints subequal. Pronotum narrowing toward head from near the base, scarcely sinuate. Anterior border slightly concave, surface finely granulate. Scutellum triangular, pronotal border slightly longer than the others, a faint median carina, surface minutely granulate. Elytra narrow, the venation weak but distinct.

Color dark brown, the apical half of the fourth antennal joint rufous; the elytra have two diffuse yellowish spots at base of membrane, the membrane brown. Abdomen uniformly red-brown. Beneath red-brown. The legs darker.

Genital segment, male, broad oval, the posterior margin subangulate, the lateral lobes small.

This species described from one specimen, male, collected at Cincinnati by Mr. Dury, is nearly the size, slightly larger, than simplex, but it differs in shape, being narrower proportionately, and its color is quite distinct from any specimens of simplex that have come under my observation. It also differs in the carina on the scutellum, the shape of the genital segment, and the smaller lateral lobes.

In addition to the species treated above, I have a specimen of larval *Aradus* from Mr. Dury, which from antennal characters appears to be different from any American species known to me, and it is hoped adult individuals may be secured so that it may be properly characterized.
