with an appressed blackened spine; penis-guard conspicuously narrowed at the apex.

*Habitat:* Western United States.

*Holotype*, ♂, Monterey County, California, July 22, 1896. *Paratype*, ♂, Juliaetta, Idaho, May 3, 1904. Type in the collection of the author.

This new species seems to be about as common as the only other western species of the genus, *Ptychoptera lenis* O. S. The two species are closely related but may be separated by the following key:

Size larger (male, wing over 11 mm.); abdominal tergites black, including the hypopygium; lobes of the ninth tergite of the male hypopygium with a subapical black appressed spine on the ventral surface. *P. lenis* O. S.

Size small (male, wing under 9 mm.); abdomen with the sides of the tergites and the hypopygium reddish; lobes of the ninth tergite of the male hypopygium with a blunt reddish ventral lobe some distance before the tip. *P. minor* n. sp.

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## Notes on Buprestidae with Descriptions of New Species (Coleop.).

By Josef N. Knull, Bureau of Plant Industry, Harrisburg, Pennsylvania.

The following is a list of host-plants and emergence records of *Buprestidae* collected by the author and reared at Hummelstown, or Harrisburg, Pennsylvania. In all cases, the material was caged under out-of-door conditions.

**Chalcophorella campestris** Say. At Harrisburg, Pa., ninety living adults were chopped from their pupal cells in a dead beech (*Fagus americana*) about 14 inches in diameter on March 13, by Mr. H. B. Kirk and the author. The adults, which appear in the spring, transform in the fall and pass the winter in the pupal cells. The species was also reared from dead willow (*Salix nigra*) and buttonwood (*Platanus occidentalis*).

**Buprestis rufipes** Fab. Pupae of this beetle were observed in the heart-wood of a dead American elm (*Ulmus americana*) at Hummelstown, Pa., June 28, and on July 10 the adults were mature. Adults were also reared July 5 from the wood of a dead sour gum (*Nyssa sylvatica*) collected at Hummelstown, Pa. Beetles were also reared from dead beech (*Fagus americana*) and hickory.

**Buprestis lineata** Fab. Adults were reared from dead Virginia pine (*Pinus virginiana*) collected at Rockville, Pa.

**Buprestis consularis** Gory. Remains of adults were found in the wood of a dead pitch pine (*Pinus rigida*) at Charter Oak, Pa.

**Buprestis fasciata** Fab. Adults were found in abundance on freshly cut pine log at Endeavor, Pa., July 30.

**Buprestis striata** Fab. Breeds in dead soft and pitch pines. Adults which appear in the spring transform in the fall and pass the winter in the pupal cells.

**Dicerca prolongata** Lec. Was found breeding in the wood of a dead large-toothed aspen (*Populus grandidentata*) at Charter Oak, Pa.

**Dicerca divaricata** Say. This species does not seem to prefer any particular host-plant, and can be found breeding in a great variety of forest trees. Adults were reared from the dead wood of the following trees, collected at Hummelstown, Pa.: black birch (*Betula lenta*), ironwood (*Ostrya virginiana*), linden (*Tilia americana*), white ash (*Fraxinus americana*), sugar maple (*Acer saccharum*), redbud (*Cercis canadensis*), black ash (*Fraxinus nigra*) and American elm (*Ulmus americana*).

**Dicerca pugionata** Germ. On July 19, adults of this species were reared from witch-hazel (*Hamamelis virginiana*) collected at Manada Gap, Pa. Many of the witch-hazels in this section have been killed by this insect.

**Dicerca obscura** Fab. This species breeds in the dead wood of persimmon (*Diospyros virginiana*), although adults were reared from the dead wood of staghorn sumach (*Rhus typhina*) collected at Hummelstown, Pa.

**Dicerca lurida** Fab. The common host-plant of this insect is hickory, although it will breed in a great variety of dead trees. Adults were reared from dead blue beech (*Carpinus caroliniana*) and alder (*Alnus rugosa*) collected at Hummelstown, Pa.

**Dicerca lepida** Lec. This beetle breeds in dead ironwood (*Ostrya virginiana*). From material collected at Hummelstown, Pa., adults emerged from July 11 to July 29.

**Dicerca scobina** Chev. Breeds in the dead wood of sour gum (*Nyssa sylvatica*). Adults were reared August 5 from material collected at State College, Pa. The adults emerge late in the season and hibernate through the winter. On March 24 a living adult was taken under the loose bark of a sour gum at Hummelstown, Pa.

**Dicerca americana** Hbst. Two living adults were found on December 13 and January 9 at State College, Pa., hibernating under the loose bark of a dead pine.

**Dicerca punctulata** Sch. Found breeding in pitch pine (*Pinus rigida*) at Hummelstown, Pa.

**Poecilonota cyanipes** Say. An adult was reared June 6, from a *Saperda concolor* Lec. gall on a branch of large-toothed aspen (*Populus grandidentata*) collected at Milford, Pa., by Mr. H. B. Kirk.

**Cinyra gracilipes** Melsh. Adults were reared from dead white oak (*Quercus alba*), swamp white oak (*Quercus bicolor*) and ironwood (*Ostrya virginiana*) collected at Hummelstown, Pa. Mr. A. B. Champlain informs me that he has reared this species from dead ash collected at Harrisburg, Pa.

**Melanophila fulvoguttata** Harr. At Hummelstown, Pa., this insect was found breeding in the bark of dead and dying hemlocks (*Tsuga canadensis*). The work was confined entirely to the bark, and none of the larvae had entered the sapwood.

**Anthaxia viridifrons** Lap. Was reared during June from the sapwood of dead American elm (*Ulmus americana*) and hickory branches.

**Anthaxia quercata** Fab. *Anthaxia cyanella* Gory can well be united with this species, as both forms are often reared from the same stick of wood. Adults were reared May 30, from the sapwood of dead redbud (*Cercis canadensis*) branches collected at Hummelstown, Pa.; also on May 29, from the sapwood of dead (*Crataegus coccinea*) branches collected at Harrisburg, Pa., and from the sapwood of a dead white pine (*Pinus strobus*) branch collected at Manada Gap, Pa.

**Anthaxia flavimana** Gory. Breeds in white oak.

**Chrysobothris femorata** Fab. Breeds in the bark and sapwood of a great variety of dead and dying fruit and forest trees. In Pennsylvania it seems to be largely secondary in its attack.

**Chrysobothris dentipes** Germ. Was reared from the bark of a dead white pine (*Pinus strobus*) collected at Dauphin, Pa.

**Chrysobothris blanchardi** Horn. A number of adults were reared June 11, from the bark of a dead pitch pine (*Pinus rigida*) collected at Hogestown, Pa.

**Chrysobothris scabripennis** Lap. & Gory. Adults chopped from the sapwood of dead white pine at Charter Oak, Pa., in June.

**Chrysobothris pusilla** Lap. & Gory. Reared May 15 from the sapwood of a dead pitch pine (*Pinus rigida*) branch collected at Hummelstown, Pa.

**Chrysobothris sexsignata** Say. From material collected at Hummelstown, Pa., adults were reared as follows: On May 29, from the sapwood of dead hemlock (*Tsuga canadensis*); on July 12, from the bark of dead black ash (*Fraxinus nigra*); on June 11, from the sapwood of dead white ash (*Fraxinus americana*); on July 3, from the sapwood of a dead red maple (*Acer rubrum*); on July 17, from the sapwood of a dead swamp white oak (*Quercus bicolor*) branch. It also breeds in the sapwood of dead walnut (*Juglans nigra*) and in the injuries made by the larvae of *Agrilus juglandis* in the bark of living butternut (*Juglans cinerea*), the eggs being laid in the emergence holes of the *Agrilus* adults.

**Chrysobothris azurea** Lec. Breeds in the sapwood of dead alder (*Alnus rugosa*) and swamp white oak (*Quercus bicolor*) in the vicinity of Hummelstown, Pa.

**Chrysobothris harrisii** Hentz. Adults were reared in June from small branches of Virginia pine (*Pinus virginiana*) collected at Hummelstown, Pa.

**Actenodes acornis** Say. From material collected at Hummelstown, Pa., adults were reared as follows: On June 15, from the wood of dead red maple (*Acer rubrum*); on June 24, from dead beech (*Fagus americana*); on June 6, from dead black birch (*Betula lenta*); on June 10, from dead hickory branch; on June 15, from dead black oak (*Quercus velutina*). The larvae work through the heart-wood of the host-plants, often entirely riddling them.

**Acmaeodera culta** Web. On September 7, a living adult was chopped from a dead hickory branch at Cresco, Pa. Adults were reared August 10 from dead white oak (*Quercus alba*) branch collected at Hummelstown, Pa.

**Ptosima gibbicollis** Say. In the vicinity of Hummelstown, Pa., this species breeds in redbud (*Cercis canadensis*), often attacking living trees, hastening their death and decay. The larvae work in the heart-wood of the tree and the adults which appear in the spring mature in the fall and pass the winter in the pupal cells.

**Eupristocerus cogitans** Web. Forms galls on alder (*Alnus rugosa* and *A. incana*). The egg, which is covered with a chitinized protective covering, is deposited at a node, or at a point where the bark is rough. The egg hatches and the young larva goes beneath the bark after which it works down the stem for a short distance. It then encircles the stem, which injury later forms a gall on the plant. The life history extends over a period of two years, and the pupa cell is made at the top of the gall.

**Agrilus juglandis** n. sp.

Form and color of *A. masculinus*. Antennae greenish, not quite reaching beyond the middle of the prothorax, serrate from the fourth joint; head slightly convex, a feeble occipital impression, more distinct in the female; front densely punctate, becoming slightly strigose on occiput, middle of front to clypeus covered with long white pubescence.

Prothorax wider than long, narrowed at base, sides in front arcuate, lateral margin sinuate, hind angles with a well defined carina in both sexes; disk convex, with an oblique lateral depression on each side, two depressions on median line as in *A. otiosus;* surface transversely strigose. Scutellum transversely carinate, surface granulate. Elytra slightly sinuate behind the humeri, dilate behind the middle, apices separately rounded and serrulate; disk with a faint costa on each side, basal depressions shallow, sutural margin elevated behind the middle; surface closely imbricate-granulate. Body beneath more shining than above, prosternal lobe broadly emarginate; prosternal process broad, slightly narrowing, acute at tip. Pygidium without a projecting carina. First joint of hind tarsus as long as the following three joints: tarsal claws deeply

cleft, the lower portion turned inward, nearly touching that of the opposite side, claws on all three pairs of feet in both sexes similar. Length 55 mm.; width 1 mm.

♂.—All three pairs of tibiae mucronate on the inner side.

♀.—Only anterior and middle tibiae mucronate on the inner side.

Described from a large series of adults, most of which were beaten from the foliage of butternut (*Juglans cinerea*). *Type* collected by the author at Hummelstown, Pa., June 9, on butternut. *Allotype* reared from the outer bark of living butternut (*Juglans cinerea*) collected at Linglestown, Pa., by the author. Both types in the author's collection.

The beetle breeds in the outer bark of living butternut (*Juglans cinerea*). The injury made by the larva makes the tree susceptible to attack of other insects and *Chrysobothris femorata* Fab. and *Chrysobothris sexsignata* Say are often found working together with the above species.

In the vicinity of Hummelstown, Pa., the pupal stage was observed on May 15, and the first adults appeared about May 25. Mr. Champlain states that the beetle causes considerable damage to the butternut in the vicinity of Lyme, Connecticut.

In general appearance this species resembles *A. masculinus*, but according to Dr. Horn's key* it should be placed next to *A. otiosus*. It has been confused with *A. otiosus* in collections, but the males can easily be separated from the males of this species by the lack of the median line of pubescence on the ventral surface.

**Agrilus otiosus** Say. Hickory seems to be the common host-plant of this species, although on June 5 adults were reared from a dead branch of persimmon (*Diospyros virginiana*) collected at Rockville, Pennsylvania.

**Agrilus frosti** n. sp.

Form of *A. otiosus*. Antennae greenish; reaching beyond the middle of the prothorax, serrate from the fourth joint; head convex, densely punctate, becoming strigose on occiput.

Prothorax wider than long, narrowed at the base, sides feebly arcuate, more strongly in the female, lateral margin sinuate, hind angles of male faintly carinate, carina sometimes nearly obliterated in the female; disk

* G. H. Horn. The Species of Agrilus of Boreal America, Trans. Amer. Ent. Soc., V. 18, p. 277–336, 1891.

convex, two median depressions with an oblique lateral depression on each side, surface transversely strigose. Scutellum transversely carinate, surface granulate. Elytra sinuate behind the humeri, dilate behind the middle, apices separately rounded and serrulate; basal depressions slight, sutural margin elevated behind the middle, surface closely imbricate-granulate. Body beneath more shining than above, prosternal lobe with slight emargination, prosternal process slightly narrowing, acute at tip, median line of pubescence lacking in both sexes, first two ventral segments of male flat, but not pubescent, Pygidium without a projecting carina. First joint of hind tarsus as long as the three following joints; tarsal claws deeply cleft, the lower portion turned inward, nearly touching that of the opposite side, claws on all three pairs of feet in both sexes similar. Length 4 mm.; width .75 mm.

♂.—Front bright green, tibiae on all three pairs of feet mucronate.

♀.—Front bronze, posterior tibiae not mucronate.

Described from a series of three males and seven females. *Type* male and *allotype* collected at Framingham, Massachusetts, May 28, by Mr. C. A. Frost; two paratypes at Charter Oak, Pennsylvania, June 21, by Mr. H. B. Kirk and the author; one from Berks County, Pennsylvania, June 1, without collector's label; one Harrisburg, May 24; one Chambersburg, Pennsylvania, June 6; and one Hummelstown, June 2, by the author. Type material in the author's collection, two paratypes in the collection of the Bureau of Plant Industry.

I take pleasure in naming this species after my friend, Mr. C. A. Frost, who has determined much material for me and given me many valuable suggestions.

The species has been confused with *A. otiosus* in collections, but the lack of the ventral median pubescent stripe in the male will at once separate it from this species. The male genitalia are also different from those of *A. otiosus* and *A. juglandis*, being flattened and flared at the apex. The sides are densely punctate above and below. In *A. otiosus* and *A. juglandis* the sides of the male genitalia are nearly parallel near the apex.

The male also lacks the ciliate antennae of *A. crinicornis* and the fimbriate and truncate last ventral segment of *A. defectus*. According to Dr. Horn's key, it would come after *A. otiosus*.

The following table will serve to separate the males of the of the eastern species of the *otiosus* group.

Tibiae of male on all three pairs of feet mucronate at the inner apical angle.
Male pubescent on the median line of under side.....*otiosus* Say.
Male not pubescent on the median line of under side.
Male with the sides of the genitalia nearly parallel at apex, flared in middle, sides sparsely punctate.....*juglandis* n. sp.
Male with sides of genitalia flared near apex, sides densely punctate. *frosti* n. sp.
Male with the last ventral truncate and fimbriate:.....*defectus* Lec.
Male with antennae long, slender and ciliate on the posterior side with relatively long hairs.....*crinicornis* Horn.

**Agrilus masculinus** Horn. Adults were reared on April 14 from the sapwood of dead box elder (*Acer negundo*) branches collected at Harrisburg, Pa.

**Agrilus defectus** Lec. On May 29, adults of this species were reared from the dead branches of white oak (*Quercus alba*) collected at Hummelstown, Pa.

**Agrilus arcuatus** Say. Adults were reared from girdled branches of the following trees: On July 18, from black oak (*Quercus velutina*) collected at Manada Gap, Pa.; on May 31, from beech (*Fagus americana*) collected at Harrisburg, Pa.; on June 7, from hickory (*Hicoria ovata*) collected at Hummelstown, Pa. The egg seems to be laid on a small twig, where it hatches and the small larva enters the bark, working its way down the cambium to the branch. Later the branch is girdled and the larva, still in the girdled part, travels from one to six inches from point of girdling, where it enters the wood and forms a pupal cell. The girdled branch falls in the spring, after which the adult emerges.

**Agrilus vittaticollis** Rand. Was found breeding in the living stems of shadbush (*Amelanchier canadensis*) at Dauphin, Pa.

**Agrilus bilineatus** Web. Breeds in oak and chestnut, often causing the death of unhealthy trees.

**Agrilus anxius** Gory. Breeds in various species of birch. At Speeceville, Pa., it was found to be killing the poplars (*Populus grandidentata*) which had been attacked by the poplar borer (*Saperda calcarata* Say).

**Agrilus cephalicus** Lec. Was reared from the sapwood of dead dogwood (*Cornus florida*). This species is often confused with *A. otiosus*, but can easily be separated by the tarsal claws.

**Agrilus politus** Say. Breeds in living willow and striped maple (*Acer pennsylvanicum*).

**Agrilus fallax** Say. Adults were reared by Mr. H. B. Kirk, from dead branches of honey locust (*Gleditsia triacanthos*) collected at New Cumberland, Pa.

**Agrilus obsoletoguttatus** Gory. Was reared from the dead branches of the following species, collected at Hummelstown Pa.: On June 15, from beech (*Fagus americana*); on June 2, from blue beech (*Carpinus*

*caroliniana*); on June 12 from ironwood (*Ostrya virginiana*); on June 9, from red oak (*Quercus rubra*); on June 17, from hickory.

**Agrilus subcinctus** Gory. Mr. H. A. Wenzel informs me that he takes this species on the foliage of poison ivy (*Rhus toxicodendron*), and the numbers taken indicate that poison ivy is the host-plant.

**Agrilus lecontei** Saund. Breeds in the wood of dead hackberry (*Celtis occidentalis*) in the vicinity of Harrisburg, Pa.

**Agrilus egenus** Gory. Breeds in the wood of dead black locust (*Robinia pseudacacia*) in the vicinity of Harrisburg, Pa.

**Agrilus celti** n. sp.

Form and color of *A. egenus*, males often more greenish. Antennae greenish, reaching the middle of the prothorax, serrate from the fifth joint, serrate joints longer than wide; head convex, with faint median impression, front densely punctate, becoming strigose on occiput, middle of front to clypeus covered with long white pubescence.

Prothorax wider than long, sides not strongly arcuate, hind angles rectangular, with a well-defined carina in both sexes; disk convex, median impressions light, lateral depressions well-marked, surface transversely strigose. Scutellum transversely carinate, surface granulate. Elytra sinuate behind the humeri, dilate behind the middle, apices separately rounded and serrulate, basal depressions slight; disk depressed, surface imbricate-granulate. Body beneath more shining than above, prosternal lobe strongly emarginate. Pygidium without a projecting carina. First joint of hind tarsus as long as the following three joints; tarsal claws broadly toothed at base, claws similar on all three pairs of feet in both sexes. Length 4.5 mm.; width 1 mm.

♂.—Front more densely pubescent, greenish; prosternum densely pubescent, with pubescence extending on the second abdominal segment, first and second abdominal segments broadly but not deeply channelled; sides of genitalia nearly parallel.

♀.—Front less densely pubescent and less bright, without the stripe of dense white pubescence on under side, first and second abdominal segments without channel.

Described from a large series of adults reared from dead branches of hackberry (*Celtis occidentalis*), collected at Hummelstown, Pa., by Mr. H. B. Kirk and the author.

*Type* male and *allotype* in author's collection and reared June 3, from dead hackberry (*Celtis occidentalis*) branches collected at Hummelstown, Pa., by the author.

This species has been confused with *A. egenus* in collections, and although it is hard to separate the females from those of *A. egenus*, the males may be easily separated by an examination of the genitalia.

In *A. celti*, the sides of the male genitalia are nearly parallel, while in *A. egenus* there is a decided flare near the apex.

According to Horn's key, this species would come after *A. egenus*.

**Pachyscelus laevigatus** Say. At East Falls Church, Virginia, the larvae of this species were found mining in the leaves of *Lespedeza virginica*, *Meibomia obtusa* and *M. viridiflora*. The larva makes a small round cell between the layers of the leaf, where it passes the winter. In spring transformation occurs, and the adult emerges by the lifting of a small hinged lid.

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## New or Interesting Psyllidae of the Pacific Coast (Homop.).

By D. L. CRAWFORD, College of Hawaii, Honolulu.

Mr. W. M. Giffard, of Honolulu, has during the past few years collected a considerable number of Psyllidæ in California and Oregon, representing some twenty-four species, one of which is new and another represents a new variety of a previously known species. Several others are more or less interesting because of the added distributional data furnished.

The types of the new species and variety are deposited in the Museum of the California Academy of Sciences, San Francisco, by request of Mr. Giffard.

**Aphalara (Anomocera) anomala** Crawford, U. S. Nat. Mus. Bul. 85, p. 37, 1914.

This anomalous species of *Aphalara* with nine-segmented antennæ and a supernumerary marginal cell in the forewings was described from three females from northern California. Mr. Giffard has collected three additional females from Niles Canyon, Alameda County, California. These are closely similar to the type.

**Euphyllura arctostaphyli** Schwarz. Crawford, U. S. Nat. Mus. Bul. 85, p. 116, 1914.

There is a good series of this species and its variety *niveipennis* Schwarz in Mr. Giffard's collection. Eight specimens