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CANADA MOONSEED VINE (MENISPERMACEAE): HOST OF FOUR ROUNDHEADED WOOD BORERS IN CENTRAL OHIO (COLEOPTERA: CERAMBYCIDAE)

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Abstract.—The lamiine longicorn beetles *Hyperplatys aspersa, Urgleptes querci, Psenocerus supernotatus,* and *Eupogonius pauper* (Coleoptera: Cerambycidae: Lamiinae) were reared from dead vines of Canada moonseed, *Menispermum canadense* (Menispermaceae), collected at a gallery forest site in central Ohio. Except for that of *Psenocerus supernotatus,* these constitute new host plant association records for larvae of these cerambycids. *Hyperplatys aspersa* was also reared from dead stems of common burdock, *Arctium minus* (Compositae).

Key Words: Cerambycidae, Lamiinae, *Hyperplatys,* ecology, Canada moonseed, Menispermaceae

The Menispermaceae consists largely of Neotropical twining lianas and lianoid shrubs, many containing pharmacologically potent isoquinoline alkaloids such as the Amerindian arrow poison curare (D-tubocurare) obtained from *Chondrodendron tomentosum* Ruiz & Pav. (Staff of the Liberty Hyde Bailey Hortatorium 1976). Canada moonseed, *Menispermum canadense* L., is a counter-clockwise twining woody vine widely distributed in lowland forests in moist rich soils along streams in the eastern United States and west to Manitoba and Oklahoma (Fernald 1950). In this habitat it attains modest heights (ca. 6 m) in the understory and is commonly found associated with grape which its leaves closely resemble. MacDermott (1986) reports moonseed as a noxious weed in commercial vineyards. Stems and rhizomes contain several toxic alkaloids; eating of fruits has resulted in human fatalities due to the curare-like action of dauracine (Foster 1989).

We collected dead moonseed vines (decayed for several months to a year) in early March 1992 from a gallery forest dominated by cottonwoods (*Populus deltoides* Marsh.), box elders (*Acer negundo* L.) and grape along the Olentangy River in central Ohio (Whetstone Park, Columbus, Franklin Co.). Wherever moonseed vines grew some had been severed above ground, presumably during winter by cottontail rabbits [*Sylvilagus floridanus* (Allen)]. Some clipped dead vines eventually became oviposition sites for cerambycids. Dead distal portions of other unsevered unfallen vines also contained borer larvae although more proximal sections were still living. Dead vines in the litter also contained borers.

From these vines we removed several dozen late stage lamiine cerambycid larvae and held them at room temperature for eclosion. We report herein a new host plant association for three of the four roundheaded wood borer species we found in Canada moonseed, and note a longstanding taxonomic confusion in published literature which has contaminated host records for one of them.

Voucher specimens of all four cerambycid species are held in the personal collection of the first author at Columbus.

Discussion

From Canada moonseed vines collected on 7 March 1992 several cerambycid pupae had formed within 36 h, and ca. 5 d later the first of many adult *Psenocerus supernotatus* (Say) eclosed (Fig. 1). These beetles (Lamiinae: Apodasyini) (Chemsak and Linsley 1982) formed their pupal cells in the central pithy core of host vines. A second apodasyine species, *Eupogonius pauper* LeConte (Fig. 2), also formed pupal cells within the pith core and eclosed during this period but it was one tenth as common.

Larvae of two additional cerambycid species began pupating about a week later, after forming more flattened pupal cells paralleling the epidermis, away from the pithy core. We identified emerging adults as *Urgleptes querci* (Fitch) (Fig. 3) and *Hyperplatys aspersa* (Say) (Fig. 4) (Lamiinae: Acanthocini). *Urgleptes querci* occurred ca. four times more often than *H. aspersa*; neither species was numerous.

The degree of species packing evidenced by this guild of four longicorn beetles in Canada moonseed vines reflects the array of larval food resources and complex internal architecture of the host plant. Larvae of the two apodasynine species form short cylindrical pupation cells in the central pithy core. Their cylindrical pupae reflect this microsite preference. Conversely, the two acanthocine species with more flattened pupae have larvae that excavate longer pupation cells with more elliptic cross section in outer woody zones near the epidermis. While characteristic defensive twisting pupal motions of all four species are similar, the two acanthocines move farther and more rapidly, both forward and backward, perhaps in response to their relatively greater accessibility by parasitic Hymenoptera. Further resource partitioning along tribal lines is evidenced in distinct phenologies and larval feeding site (nutritional) preferences. We suggest that vines like these function as platforms of adaptive radiation in the insects that use them, much as Zwölfer (1982) has shown for Cardueae (Compositae) flower head insects.

According to Carlquist (1991) lianas and vines, much more so than self-supporting woody plants, are characterized by cambial variants novel among dicotyledons: vessel elements are typically very long and wide with large perforation plates, and cell walls lack lignification. Twining vines like those in *Menispermum* are limber due to reduced secondary xylem and lignin, to large intercalated pith rays, to a large central pithy core, and to a small stem diameter. Acceptability of vines to suites of generalist borers may in part be due to their structural complexity, and partly a consequence of their favorable ratio of labile to recalcitrant dietary components. We note a disproportionately high incidence of vines among those plants reported as hosts for Cerambycidae (e.g. Knull 1946).

None of the four borers we found in moonseed is a host specialist. *Psenocerus supernotatus* is found in plants of 17 genera (Linsley and Chemsak 1984), including seven vines in five families, *E. pauper* in plants of 19 genera, including two vines in as many families. Knull (1946) lists 11 host plant genera for *U. querci,* including two vines in different families. Herein we also record *H. aspersa* in Canada moonseed vines. In addition, several adults of this species have been reared (Columbus, Ohio, 1992) from larvae found in weathered, twice-overwintered standing canes of common burdock, *Arctium minus* (Hill) Bernhardi (Compositae), a new host plant record.

Taxonomic Confusion in *Hyperplatys*

Published host plant records for *H. aspersa,* according to Gardiner (1961), are

Fig. 1. *Psenocerus supernotatus* (Say).

"completely misleading" due to a long history of taxonomic confusion between this species and *H. maculata* Haldeman. In an article describing only immature stages and biology of these two sympatric eastern North American *Hyperplatys,* he stated that adults were misdetermined by Blatchley (1910), Felt (1924), Knull (1946), "and others," and

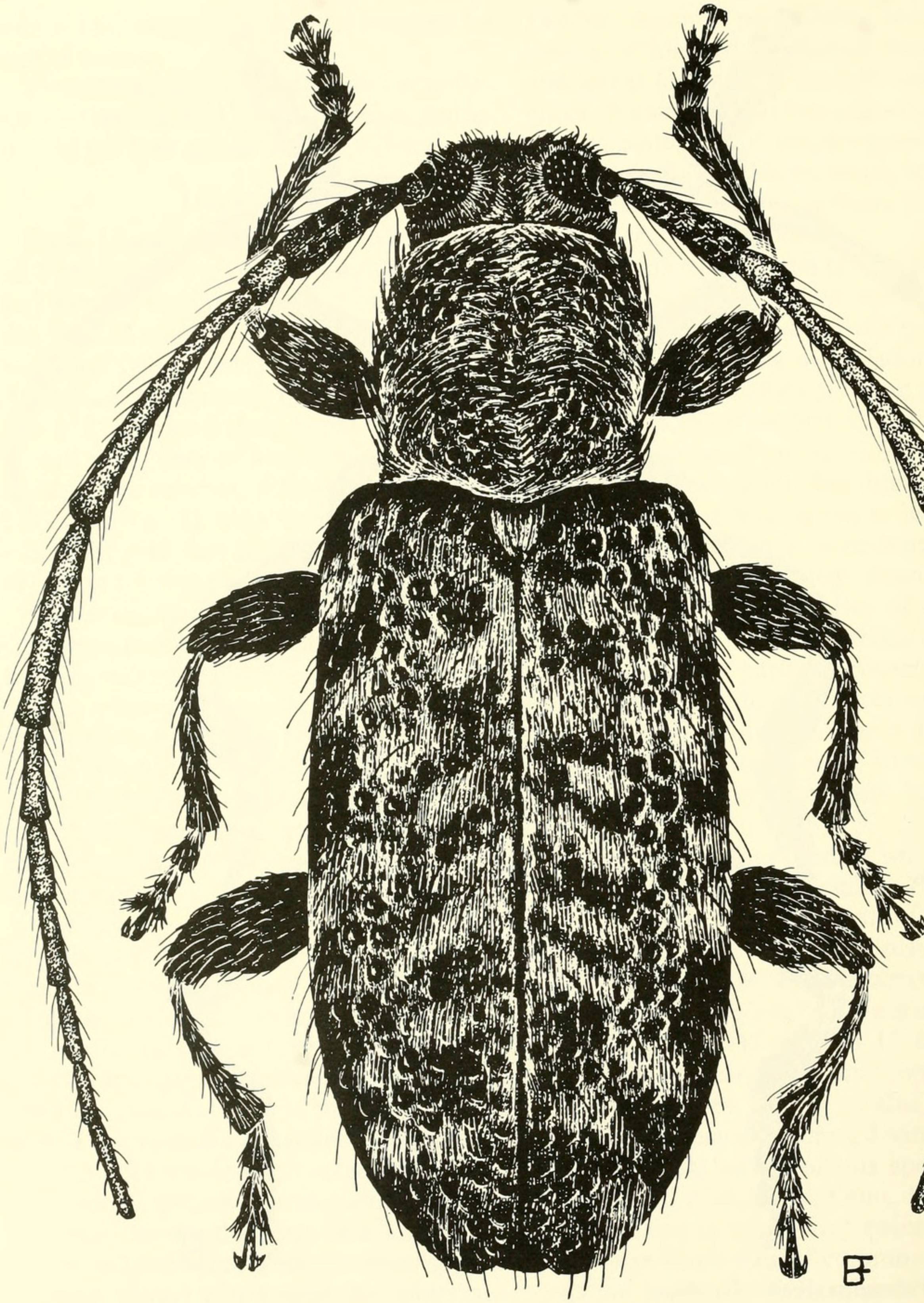

Fig. 2. *Eupogonius pauper* LeConte.

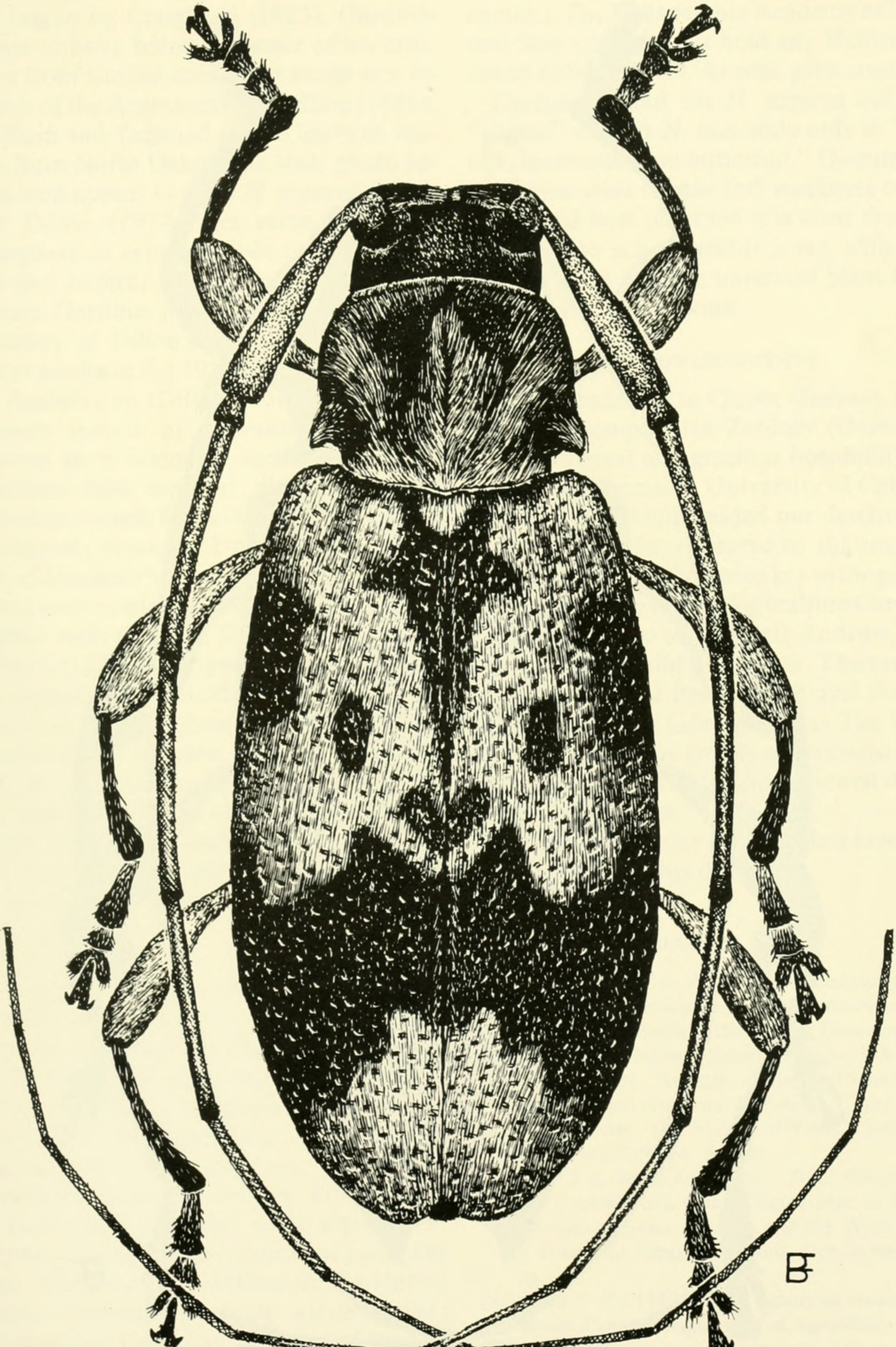

Fig. 3. *Urgleptes querci* (Fitch).

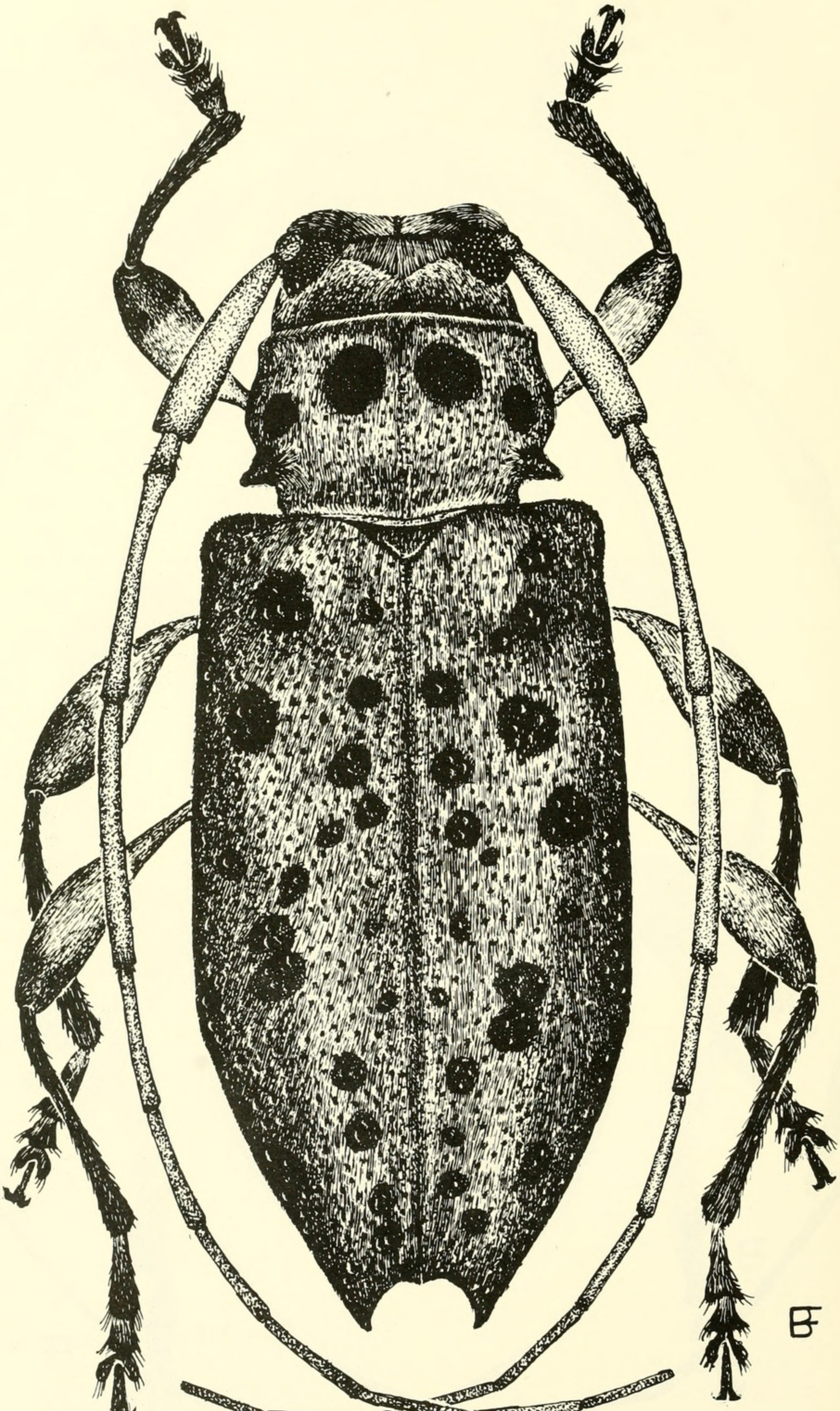

Fig. 4. *Hyperplatys aspersa* (Say).

the larvae by Craighead (1923). Gardiner seems to have borrowed some of his criticism from similar comments made in a revision of the Acanthocini by Dillon (1956a, b). Stein and Tagestad (1976) list both species from North Dakota but their photo figures both appear to show *H. aspersa.* Dillon and Dillon (1972) mix some diagnostic characters in synopses, but their included key and habitus sketches seem essentially correct. Gardiner makes no comment on the accuracy of Dillon's treatment of *Hyperplatys* adults in the 1956 revision of Nearctic Acanthocini (Dillon 1956). Dillon's diagnoses therein of *H. maculata* and *H. aspersa* seem adequate and proper to us. Gardiner does, however, cite Dillon's distribution records for both species, albeit circumspectly in quotes. Unfortunately, no series of Gardiner's reared adult *Hyperplatys,* if any ever existed, could be located in Canadian collections (B. Gill, pers. comm.).

Say's (1824) description of *H. aspersa* is inconclusive, as is Haldeman's (1847) of *H. maculata,* both authors relying on characters which are variable, inconsistently present, or common to both species. Perhaps Say had before him a mixed series: he mentions variation that leans toward the *H. maculata* facies. It is our understanding that none of Say's Cerambycidae type specimens exist today.

We examined the *Hyperplatys* in the LeConte Collection at Harvard University's Museum of Comparative Zoology (MCZ) in hopes of unambiguously resolving the identity of our reared specimens, in the way that John L. LeConte's interpretations of the Say names are often used (e.g. Lindroth and Freitag 1969). This large and well-known collection, however, contains mixed series of these species; indeed, some non-*Hyperplatys* are included. We could not locate the type of *H. maculata* Haldeman; the United States National Museum claimed that Haldeman's types had been transferred to Harvard University. This assertion has been disputed by the MCZ (C. Graham, pers. comm.). The Philadelphia Academy of Natural Sciences does not hold any Haldeman insect collections (D. Azuma, pers. comm.).

Gardiner found his *H. aspersa* only in "sumac" and his *H. maculata* only in "red oak, basswood, and butternut." Despite the confusion over names and weakness of an accredited host plant list it is clear that *H. aspersa* also is a generalist borer, with records of hosts in three unrelated plant families, including one vine.

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