The North American Species in Group X of *Ips* De Geer (Coleoptera: Scolytidae)\(^1\)

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Abstract

*Ips calligraphus* (Germar), *I. ponderosa* Swaine and *I. interstitialis* (Eichhoff) represent one variable species with the oldest name, *Ips calligraphus* (Germar) taking precedence. *Ips calligraphus* can always be recognized by the six spines on each side of the declivity. All other species in North America have less than six spines on each side.

This paper is the last of a series on the *Ips* of North America (Hopping 1961, 1962, 1963a, b, c, d, e; 1964, 1965a, b, c, d). The six-spored *Ips* of Group X are represented in North America by a single species, *Ips calligraphus* (Germar). Although the size varies greatly even within local populations, only minor and inconsistent differences occur in other characters.

*Ips calligraphus* (Germar)

*Bostrichus echoroticus* De Jean, 1837, Dej. Cat.: 232.
*Bostrichus formosus* De Jean, 1837, Dej. Cat.: 232.
*Tomicus praemorsus* Eichhoff, 1867, Berl. ent. Z. 11: 401.

1. *calligraphus* is 3.5-6.5 mm. long and 1.2-2.2 mm. wide (Fig. 1). Fully pigmented adults are black with dark brown legs and antennae.

The female has the front of the head slightly and evenly convex, granulate-setose with the area between granules usually smooth and shining; a median tubercle is situated at a distance equal to the width of the eye above the epistomal margin (Fig. 2).

The pronotum is slightly more than 1.2 times longer than wide, having the sides slightly and evenly arcuate from the base to the apical fourth where they are obtusely angled to the broadly rounded front margin; lorum rugosities extend to slightly behind the centre of the pronotum and farther back on the sides; punctures on the caudal median portion vary from fine (0.02 mm. in diameter) on some individuals to medium coarse (0.05 mm. in diameter) on others, becoming denser and coarser (0.05 mm. in diameter) towards the lateral margins.

Elytra are 1.5 times longer than wide, having the lateral margins sub-parallel from the base to about the caudal fifth where they are gradually rounded inward to the margins of the declivity. Striae are moderately impressed making the interspaces slightly convex; striae punctures are coarse, 0.05 mm. in diameter and separated by this distance or less. The first interstria is uniseriately punctate-setose with granules almost obsolete except near the declivity; the second interstice is usually punctate-setose with the line of punctures usually along the inner edge of the interstice near the striae; the third interstria is often impunctate except near the declivity; the remaining interspaces are more regularly, uniseriately punctate-setose; the punctures being closer together than on the interspaces nearer the suture. The first declival spine is about 0.07 mm. long, conical, slightly curved and acute at the tip; the second spine is also conical, sub-acute at the tip and twice the length of the first when the broad tumescent base is included; the third spine is similar in shape to the second but much stouter, more rounded at the tip and asymmetrical because the tumescent base is extended on one side to the base of the second spine; the fourth spine is a little longer than the second, slightly more cylindrical, with a conical sub-acute tip; the fifth spine is similar to the fourth but a

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Figs. 1-5. The *Ips* of Group X. 1, *I. calligraphus* (♂) Germar; 2 (♀), 3 (♂), front of head; 4 (♀), 5 (♂), declivital spines (lateral).
little larger; the sixth spine is a stout cone considerably shorter than the fifth spine (Fig. 4); the caudal edge of each elytron is emarginate. Punctures on the declivity are slightly smaller than striae punctures and the elevated sutural margins are granulate-setose. The ventral punctuation is about the same as in the five-spined Ips, the diameter of a puncture on the antero-lateral portions of the metasternum being about 60.2 mm. in diameter and the surface between punctures microreticulate (magnification × 50).

The male differs from the female by having a larger median tubercle on the frons (Fig. 3), usually coarser punctuation and having a larger third declivital spine which has a notch on the ventral side resembling a crochet hook (Fig. 5). It is similar to the third spine of the five-spined Ips.

*I. calligraphus* occurs in eastern Canada, throughout most of the United States, south to Honduras and on some Caribbean islands (Fig. 7). Culema and Veracini (1963) reported that *Ips intersticialis* has been established in the Philippine Islands where it attacks *Pinus insularis* Endl. The type locality of *I. calligraphus* is Kentucky. The gallery pattern is shown in Fig. 6.

Specimens have been seen from Halifax in Nova Scotia; Montreal in Quebec; Toronto, 1000 Isles, Ottawa, Algonquin Pk., Port Hope and Sudbury in Ontario; Durham and Pelham in New Hampshire; West Point, Bath, Buffalo, Ithaca, Islip, Lansingburg, Saratoga Spgs., Hamburg and Syracuse in New York; North
Fig. 7. Distribution of *ips calligraphus* (German). ● Specimens seen. ○ Reported.
Saugus, Berkeley and Berkley in Massachusetts; Lakehurst, Iona, Clementon, Riverton, South Amboy and New Foundland in New Jersey; Frankford, Philadelphia, Pocono Lake and Clarion Co. in Pennsylvania; Bladensburg and College Park in Maryland; District of Columbia; Norfolk, Arlington, Va. Beach and Nelson Co. in Virginia; Kanawha Sta., Hampshire, Wood Co. and Grant Co. in West Virginia; Asheville, Fayetteville, Fletcher, Boardman, Tryon, Edenton and Raleigh in North Carolina; Mississippi City, Baxwier, Meridian, Nicholson, Biloxi and Ocean Springs, in Mississippi; Grand Bay, Calhoun, Mobile and Gadsden in Alabama; Nashville and Chatanooga in Tennessee; Wainsville, Clayton, Tybee Is. and Savannah in Georgia; Barto, Winter Park, Tampa, Jackson, Tarpon Spgs., Sanford, Palm Beach, Punta Gorda, Elfers, Oneco, Key West, Key Largo and Paradise Key in Florida; Marquette in Michigan; Mineral Springs in Indiana; Douglas Co. in Kansas; St. Louis in Missouri; Dierks in Arkansas; New Orleans, Shreveport and Bogalusa in Louisiana; Duluth in Minnesota; Bayfield in Wisconsin; Pine Ridge, Nenzel and Valentine in Nebraska; Harney N. F., Black Hills, Rosebud Indian Agency, Camp Crook, Nemo, Elmore and Whitewood in South Dakota; Lamedeer, Clancy and Ekalaka in Montana; Beulah, Colo. Springs, Husted, Glenhaven and San Isabel Nat. For. in Colorado; Zion Canyon in Utah; Placerville, Grass Valley, Palo Alto, Fresno Co., and Pasadena in California; Grand Canyon, Flagstaff, Prescott, Williams, Coconino N. F., Santa Catalina Mts. and San Francisco Mts. in Arizona; Meck, Las Vegas, Capitan Mts., Chiricahua Mts., Lincoln Nat’l. For. and Peloncillo N. F. in New Mexico; Houston, Kirbyville, Bastrop, Harvester and Anahuac in Texas; Temascaltepec in the State of Mexico; Zimapán in Hidalgo; Altamirano in Chiapas; San Geromino in Guatemala; Salama in Honduras; British Honduras; Grand Bahama Is. in the Bahamas; 891 specimens were seen.

Schedl (1955) gave the following localities for I. interstinctalis. Mexico: Jonacatepec in Morelos; Jalaca in Hidalgo; Omilteme in Guerrero. Guatemala: San Geromino, San Joaquin, Sierra de Chuaque, Sierra de las Minas, Estancia la Virginía, S. Tartín Jilotepeque, Guatemala Ciudad, Road Quelzaltenango-Huehuetenango behind Chiquival; Road Quelzaltenango-Huehuetenango (Rancho Alegre), Las Trohadas, Finca La Concepcion bei San Juan Sac, Poptún, Cuchumatanes; also Salama (British Honduras) and Jamaica.


The location of the type of I. calligrapbus is unknown to me. The concept of the species is based on the original description which clearly indicates a six spined Ips and on material in the U.S. National Museum, Canadian National Collection, California Academy of Sciences and the Leconte Collection at Harvard University.

The size of adults of I. calligrapbus varies rather surprisingly even within a series from one locality although the proportions remain relatively constant (Table 1). Those from Grass Valley, California, for instance, vary greatly in size while those from Prescott, Arizona, show less variation although this may be due to the small number in the series. Similarly, small series from Mexico and Guatemala do not exhibit marked variation in size. However, Blandford (1895) said of I. interstinctalis, “A long series of this species was taken by Mr. Champin, the examples varying in colour from pale testaceous to ferruginous, and in size from 3.6 to 5.4 mm.” Specimens from Guatemala and Honduras are indistinguishable from those of comparable size from Grass Valley, California, or
Table 1
Comparative measurements of *Ips calligraphus*

<table>
<thead>
<tr>
<th>Locality</th>
<th>No. of specimens</th>
<th>Length, mm.</th>
<th>Ratio: pronotum length over width</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Max.</td>
<td>Min.</td>
</tr>
<tr>
<td>Grass Valley, California</td>
<td>30</td>
<td>5.99</td>
<td>3.94</td>
</tr>
<tr>
<td>Prescott, Arizona</td>
<td>10</td>
<td>6.43</td>
<td>5.67</td>
</tr>
<tr>
<td>Asheville, North Carolina</td>
<td>18</td>
<td>5.51</td>
<td>4.48</td>
</tr>
<tr>
<td>Altamirano, Chiapas</td>
<td>9</td>
<td>4.81</td>
<td>3.51</td>
</tr>
<tr>
<td>Zhinapan, Hidalgo</td>
<td>9</td>
<td>5.79</td>
<td>4.97</td>
</tr>
</tbody>
</table>

Asheville, North Carolina. Specimens from the midwestern and southwestern United States tend to have coarser punctuation medially on the caudal part of the pronotum than those from other regions. This and the larger average size were the main characters used by Swaine (1925) to distinguish *I. ponderosae*. Both of these characters are seen to be variable when large series are available.

The males of *I. calligraphus* are easily distinguished from females by the ventral notch in the large third spine (Fig. 5). This is absent in the female and the spine is of an entirely different shape (Fig. 4). It is more difficult to distinguish the sexes in some of the five-spined *Ips* because the third spine is similar in both sexes. However, in most *Ips* species that breed in pine, the pars stridens of the sound-producing mechanism is present toward the back of the head in the female (Woo 1961). This is a reliable character to distinguish the sexes when the head is bent far enough forward to disclose it. Unfortunately many mounted specimens have the head sufficiently retracted to hide this character. Females of most species that breed in spruce do not have this type of sound-producing mechanism.

*I. calligraphus* is closely related to *Ips sexdentatus* Boerner of Eurasia. The latter differs consistently by having the third declivital spine capitate and notched on the ventral side as in *I. calligraphus* (Fig. 5). *I. sexdentatus* has a transverse carina on the frons, sometimes divided into several shorter carinae, a character entirely lacking in *I. calligraphus*. These species suggest parallel evolutionary development from parent stock originating somewhere in the early circumpolar forest.

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References


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