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A new species and synonymy in North American Phymatodes (Phymatodes) Mulsant, 1839 (Coleoptera: Cerambycidae: Cerambycinae: Callidiini)

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A new species and synonymy in North American *Phymatodes* (*Phymatodes*) Mulsant, 1839 (Coleoptera: Cerambycidae: Cerambycinae: Callidiini)

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Abstract. Phymatodes (Phymatodes) huetheri Wappes and Santos-Silva (Coleoptera: Cerambycidae: Cerambycinae: Callidiini) from upstate New York, USA and Canada is described and illustrated. Phymatodes (Phymatodes) rainieri Van Dyke, 1937 is placed in synonymy with Phymatodes (Phymatodes) fulgidus Hopping, 1928.

Key words. Longhorned beetles, taxonomy, United States of America.

Introduction

Phymatodes Mulsant (1839) was originally described without a type species designation and included three species: Cerambyx variabilis Linnaeus, 1758 (= Phymatodes (Phymatodes) testaceus (Linnaeus, 1758)), P. thoracicus Mulsant, 1839 (= Phymatodes (Phymatoderus) lividus (Rossi, 1794)), and P. humeralis Mulsant, 1839 (= Phymatodes (Phymatoderes) pusillus (Fabricius, 1787)). Later, LeConte (1850) designated Cerambyx variabilis Linnaeus, 1758 as the type species for the genus. Since then, through the last 180 years, the genus has been poorly defined and understood as evidenced by the eight generic and 38 species synonyms listed in Bezark (2018). Swift and Ray (2010) identified and corrected nine synonyms, made other taxonomic changes, and provided the most recent key to all the North American species of Phymatodes (Phymatodes). More recently, Bousquet et al. (2017) revalidated Phymatodes (Phymatodes) hardyi Van Dyke, 1928 as a species (removed from its synonymy with Phymatodes (Phymatodes) maculicollis LeConte, 1878), and provided a key to the Canadian species. The subgenus currently has 26 species recorded in North America. Laplante (1989) reported Phymatodes (P.) fulgidus from Québec (Canada), but this was subsequently found to be a misidentification of an undescribed species (Yanega (1996). Herein we describe a new species of Phymatodes and propose a newly discovered synonymy. With the new species and synonymy, the number of Phymatodes (Phymatodes) species remains the same.

Materials and Methods

Photographs were taken in the MZSP with a Canon EOS Rebel T3i DSLR camera, Canon MP-E 65mm f/2.8 1–5× macro lens, controlled by Zerene Stacker AutoMontage software. Measurements were taken in mm using a measuring ocular Hensoldt/Wetzlar-Mess 10 in a Leica MZ6 stereomicroscope, which was also used in the study of the specimens. Subgenera designations for *Phymatodes* follow those proposed by Reitter (1912) *sensu* current use (e.g. Niisato 2007; Bezark 2018; Tavakilian and Chevillotte 2018), with the American species subsequently placed in the nominotypical subgenus.

The acronyms used in the text are as follows:

ACMT American Coleoptera Museum (James Wappes), San Antonio, Texas, USA

CNC Canadian National Collection of Insects, Arachnids and Nematodes, Ottawa, Ontario, Canada

CGDR Gontran Drouin collection, Sainte-Hénédine, Québec, Canada

CMRA Michel Racine collection, Québec City, Québec, Canada

FSCA Florida State Collection of Arthropods, Gainesville, Florida, USA

IMQC Insectarium de Montréal, Québec, Canada

IRM René-Martineau Insectarium, Laurentian Forestry Centre, Canadian Forest Service, Natural Resources Canada, Québec City, Québec, Canada

JCPC Jim Cope private collection, San Jose, California

JPHC Jeffrey P. Huether collection, Geneva, New York, USA

MZSP Museu de Zoologia, Universidade de São Paulo, São Paulo, Brazil

NFRC Northern Forestry Centre, Canadian Forest Service, Natural Resources Canada, Edmonton, Alberta, Canada

RAAC Robert A. Androw collection, Gibsonia, Pennsylvania, USA

RHTC Robert H. Turnbow collection, Enterprise, Alabama, USA

RMBC R. M. Brattain collection, Lafayette, Indiana, USA

Taxonomy

Phymatodes (Phymatodes) fulgidus Hopping, 1928

Phymatodes fulgidus Hopping 1928: 246.

Phymatodes rainieri Van Dyke 1937. New synonym.

According to Van Dyke (1937), when commenting on *Phymatodes rainieri*: "Elytra two and a half times as long as broad, about three and a half times as long as prothorax, disk rather flattened, suture feebly elevated, surface coarsely punctate, rugose and shining." Linsley (1964) only provided the original descriptions of *P. (P.) rainieri* and *P. (P.) fulgidus* and reported that the latter "is apparently very close to *P. rainieri*." In the key, he separated the species by the color (piceous in *P. (P.) rainieri*; brown in *P. (P.) fulgidus*), and shape of the frontal impression (transverse in *P. (P.) rainieri*; acute above in *P. (P.) fulgidus*). However, species with brown integumental color often show great variation, and may be from very light to very dark. Although, Van Dyke (1937) did not report the shape of the sulcus between frons and clypeus in the photograph of the holotype it appears to be very much the same as in *P. (P.) fulgidus*.

According to Swift and Ray (2010) the *Phymatodes* key character (couplet 27) for *P. rainieri* is: "Elytra almost entirely glabrous, impunctate"; and in their remarks section, "This unique species, previously known from only the type specimen, is distinct within the genus. The pronotum and elytra are almost entirely glabrous and impunctate on the dorsal surface, with only a few scattered, long, golden setae towards the elytral apices. No other species of *Phymatodes* possesses this combination of characters ... **Specimens examined:** 2, including the type of P. (P.) rainieri." The affirmations on the elytral sculpturing by Swift and Ray (2010) contradict the original description. Furthermore, examination of a holotype photograph clearly indicates that the elytra are distinctly punctate, and the punctures are equal or nearly so to that in P. (P.) fulgidus. Therefore, based on holotype photographs of both species (Bezark 2018), original descriptions, and geographical distribution, P. (P.) rainieri is placed as a junior synonym of (P.) P. fulgidus.

Phymatodes (Phymatodes) huetheri Wappes and Santos-Silva, new species

(Fig. 1-14)

Phymatodes fulgidus; Laplante 1989: 63. (Misidentification).

Phymatodes sp.; Yanega 1996: 53.

Phymatodes species (CNC sp. n. #1); Webster et al. 2012: 314.

Phymatodes sp. A; Bousquet et al. 2017: 56 (key), 57 (key), 60.

Description. Male. Integument mostly dark reddish-brown (more dark-brown on some areas), slightly lighter on metanepisternum; ventral surface of head reddish-brown; clypeus, labrum, and mouthparts mostly orangish-brown; mandibles mostly orangish-brown, darkened toward apex; antennae orangish-brown, darkened on apex of antennomeres; femora orangish-brown on peduncle, brown on club; tibiae and tarsi orangish-brown; abdominal ventrites dark reddish-brown, darker on apex of I—IV.

Head. From narrow, concave; moderately coarsely, sparsely punctate laterally, finely, sparsely punctate toward central area; with long, erect, sparse reddish-brown setae; frontoclypeal sulcus deep, inverted V-shaped. Area between antennal tubercles moderately coarsely punctate (punctures partially confluent); with long, erect, sparse reddish-brown setae. Remaining surface of vertex moderately coarsely and abundantly punctate, glabrous. Antennal tubercles moderately narrow, slightly elevated, with rounded apex; smooth and glabrous. Median groove well-marked from frontoclypeal sulcus to area between antennal tubercles and upper eye lobes. Area behind upper eye lobes moderately coarsely and abundantly punctate; with a few long, erect reddish-brown setae close to eye. Area behind lower eye lobes smooth close to eye, moderately coarsely punctate toward prothorax (punctures gradually sparser toward ventral surface); with short, erect, sparse reddish-brown setae near eye. Genae minutely, sparsely punctate except smooth distal area; with minute, sparse yellowish-brown setae close to eye, glabrous on remaining surface. Postclypeus nearly horizontal in wide posterior area, narrow, abruptly inclined anteriorly (limit between these two areas slightly carina-shaped); large triangular central area of nearly horizontal region slightly depressed, moderately coarsely, confluently punctate; remaining surface smooth; with long, erect reddish-brown setae on punctate area. Labrum nearly coplanar with anteclypeus in posterior 2/3, inclined in anterior third; with long, erect, sparse reddish-brown setae on posterior area, short, erect, moderately abundant yellow setae anteriorly. Gulamentum with fine, very sparse punctures on wide posterior area, depressed, striate punctate on narrow anterior area; with short, sub-erect, very sparse reddish-brown setae on wide posterior area, with both, short, and long, sparse reddish-brown setae on anterior area. Distance between upper eye lobes 1.36 times length of scape; in frontal view, distance between lower eye lobes 1.54 times length of scape. Antennae 1.2 times elytral length, reaching about distal third of elytra (only holotype measured); scape slightly piriform, moderately coarsely sparsely punctate; with both, long and erect, moderately short and decumbent, sparse yellowish-brown setae; pedicel with long, erect yellowish setae; antennomeres with moderately short, decumbent yellowish setae throughout, gradually shorter toward distal segments; antennomeres III-VI with long, erect yellowish setae, longer, more abundant ventrally and distally; remaining antennomeres with short, erect yellowish setae. Antennal formula (ratio) based on length of antennomere III: scape = 1.26; pedicel = 0.63; IV = 1.08; V = 1.28; VI = 1.20; VII = 1.26; VIII = 0.97; IX = 0.97; X = 0.97; XI = 1.08.

Thorax. Prothorax slightly wider than long; sides uniformly rounded, with narrow posterior constriction. Pronotum with vague longitudinal carina centrally; moderately finely punctate centrally, more abundantly so laterally, where punctures become partially confluent; with long, erect, sparse yellowish-brown setae. Sides of prothorax moderately coarse, densely punctate, becoming slightly rugose; with long, erect, sparse yellowish setae. Posterior ¾ of prosternum densely micropunctate, interspersed with coarse, moderately abundant punctures; anterior quarter finely, slightly striate-punctate; with both, short and long, erect, sparse yellowish setae on punctate area, with long, erect, sparse setae anteriorly. Prosternal process triangular, reaching about middle of procoxal cavities, rugose punctate, nearly glabrous. Ventral surface of mesothorax with both, short and long, decumbent, moderately sparse yellowish setae (more whitish depending on light intensity). Ventral surface of mesothorax with both, short and long, decumbent yellowish setae (more whitish depending on light intensity), more abundant laterally, interspersed with long, erect setae of same color in metanepisternum. Scutellum nearly smooth and glabrous, longitudinally concave.

Elytra. Sides vertically inclined in basal third, gradually nearly horizontal toward apex; coarsely, abundantly punctate, somewhat rugose throughout; with sparse, moderately short, erect yellowish setae in basal area, and moderately long, erect yellowish setae near and in distal margin. **Legs.** Femora pedunculate-clavate, club distinctly widened, with short, decumbent, sparse yellowish setae. Tibiae gradually widened from base to apex; with long, erect, moderately sparse yellowish setae, more abundant ventrally. Metatarsomere I about as long as II–III together.

Abdomen. Ventrites with both, short and long, sparse yellowish setae (more whitish depending on light intensity), interspersed with long, erect setae of same color. Abdominal ventrite V transverse, often shorter than IV, with distal margin somewhat concave.

Female. Antennae 0.85 times elytral length (only one female measured), reaching between half-way to two-thirds of elytra. Prosternum finely, sparsely punctate. Femoral club less strongly widened. Abdominal ventrite V trapeziform, longer than IV, with distal margin rounded.

Variation (Fig. 10-13, male and female). Body nearly entirely orangish-brown, with only small areas dark-brown (usually along sutures and boundaries of some structures); dorsal surface entirely darkbrown, or entirely reddish-brown (light or dark), sometimes entirely orangish-brown; prosternum from entirely dark-brown to entirely light reddish-brown; metanepisternum entirely dark-brown, with irregular reddish-brown areas, or entirely dark reddish-brown, light reddish-brown or orangish-brown; clypeus, labrum, and mandibles mostly dark-brown; femora entirely orangish-brown, entirely reddish-brown, or entirely dark-brown, sometimes with apex darkened; tibiae and tarsi reddish-brown or brown; abdominal ventrites orangish-brown, reddish-brown or dark-brown, always with distal area of I-IV darkened (sometimes just slightly so); abdominal ventrite V dark-brown with anterocentral area reddish-brown or orangish-brown; from slightly concave; punctures on from similar throughout; frontoclypeal sulcus arched (Fig. 11), not distinctly V-shaped; median groove nearly indistinct between antennal tubercles and upper eye lobes; punctures in vertex somewhat finer and sparser between upper eye lobes and prothoracic margin; erect setae behind lower eye lobes moderately long; triangular central area of postclypeus slightly marked; triangular central area of postclypeus not depressed; triangular central area of postclypeus with punctures finer and not confluent; gulamentum minutely, abundantly punctate, interspersed with slightly coarser, very sparse punctures; setae on posterior area of gulamentum long; scape more cylindrical, not distinctly piriform; punctures on sides of pronotum not confluent; pronotum nearly glabrous; prosternal process nearly smooth; scutellum longitudinally concave, but with distal area elevated, making it appear depressed.

Dimensions (mm), holotype male/male paratypes/female paratypes. Total length, 6.55/4.50-5.20/5.60-6.70; prothoracic length, 1.50/1.00-1.10/1.00-1.25; anterior prothoracic width, 1.40/0.90-1.10/1.05-1.15; posterior prothoracic width, 1.25/0.90-1.05/1.00-1.20; maximum prothoracic width, 1.60/1.15-1.30/1.20-1.50; humeral width, 2.00/1.50-1.55/1.60-1.90; elytral length, 4.50/3.05-3.60/3.95-4.60.

Type material (Fig. 14). Holotype: Male from the UNITED STATES OF AMERICA, New York: Whiteface Mountain (Essex County; Mt. Topping), 6.VII.1987, J. Huether col. (FSCA). Paratypes: UNITED STATES OF AMERICA, New York: Whiteface Mountain, (Essex County), 10.VII.1985, J. Huether col. (1 female, RAAC); 3.VII.1989, J.P. Huether col. (1 female, JPHC); 19.VI.2007, J. and M. Huether col. (1 male, JPHC); 18.VI.2007, J. Huether col. (1 female, JPHC); 7.VII.2008, J. Huether col. (1 male, ACMT); 17.VII.2008, J. Huether col. (1 male, ACMT); 17.VI.2012, J. Huether col. (1 male, JPHC); 14.VII.1982, R.M. Brattain col. (1 female, RMBC); (Essex County; summit 4867'), 10-14.VII.1984, R.M. Brattain col. (1 male, 1 female, RMBC); 8-13.VII.1985, R.M. Brattain col. (1 female, RMBC); 5-11. VII.1986, R.M. Brattain col. (1 female, MZSP); 29.VI.2005, J. Huether col. (1 female, JPHC); 3.VIII.2006, J. Huether col. (1 female, JPHC); top Whiteface Mountain (Essex Co.; 4867; Mt. Topping), 17.VII.1990, B.J. and J. Huether col. (1 male, JPHC); (4800'), 5.VII.1988, J.E. Wappes col. (1 female, ACMT); 6.VII.1988, J.E. Wappes col. (1 female, ACMT); (summit), 7–8.VII.1984, J. Huether col. (1 male, ACMT); 1 male, 5.VII.1999, R. Turnbow col. (1 male, RHTC). CANADA, Alberta: Fort Assiniboine, 1939, no collector indicated (1 male, CNC# 04-9762, 1 female, CNC # 04-9763); High Level, 8.VII.1993, J. Jarrett col. (1 female, NFRC); Fort McMurray, 9.VI.2005, Alejos and Saomone col. (1 female, CNC # 00068529). Nova Scotia: Truro, 7.VII.2013, R. Matheson col. (1 female, CGDR). Ontario: 43 km WNW Hearst (49.8432°N, 84.2250°W), 18.VI–10.VII.2013, L. Venier col. (1 female, CNC # 3122396). Québec: Gaspé, 15.VII.1933, E.B. Watson col. (1 female, JCPC); Charlesbourg (Québec Co.), 4.VI.1977, M. Racine col. (1 female, CMRA); Frampton, 10.VII.1984, G. Drouin col. (1 female, CGDR); Reservoir Manicouagan (50.53°N, 68.38°W), 7–21.VII.2005, C. Hébert col. (1 male, IRM).

Remarks. *Phymatodes* (*Phymatodes*) *huetheri* sp. nov. is similar to *P.* (*P.*) *fulgidus* but differs by the punctures on pronotum and sides of prothorax distinctly denser; punctures on pronotum in *P.* (*P.*) *fulgidus* (especially centrally, and sides of prothorax) are distinctly sparser. *Phymatodes* (*P.*) *huetheri* also has metatarsomere I about as long as II–III together (distinctly longer in *P.* (*P.*) *fulgidus*).

Laplante (1989) recorded Phymatodes (P.) fulgidus from Québec (Canada), based on a single specimen (translated): "This species is reported here for the first time in Québec. This mention is based on a specimen captured by Gontran Drouin at Frampton (Dorchester), 10.vii.1984 [CGDR]." After this, Yanega (1996) reported on his *Phymatodes* sp.: "A record exists in the literature of *P. fulgidus* Hopping from Québec, Canada, but the author of the record has since concluded that the specimens (some also collected in New York) in fact represent an undescribed species, which I have had an opportunity to examine." According to Douglas Yanega (personal communication) the literature mentioned by him was Laplante (1989) who subsequently also provided the information on the misidentification. Webster et al. (2012) pointed out on *Phymatodes* species (CNC sp. n. #1): "QC, **NB** (Yanega 1996)". According to Yanega (1996) this undescribed species is related to Phymatodes ater LeConte but lacks the prominent pronotal calli and possesses finer elytral punctures." We now know that the record for Québec in Yanega (1996) is Phymatodes (P.) huetheri sp. nov. However, we cannot affirm that the specimen from New Brunswick (Canada) in Webster et al. (2012) is P. (P.) huetheri sp. nov., although Bousquet et al., 2017 indicated that it is: "We have seen specimens of this undescribed species from Québec, Ontario, and Alberta, and it was recorded also from Fredericton in New Brunswick (Webster et al. 2012: 314)." It is important to note that we examined the specimen listed as P. fulgidus by Laplante (1989) and confirm its identity as P. (P.) huetheri. Furthermore, Bousquet et al. (2017) also pointed out that the specimen of Phymatodes sp. A, from "Frampton, 10.VII.1984, G. Drouin (1, CGDR)" was reported in Laplante (1989: 63) as P. fulgidus, but it is also P. (P.) huetheri sp. nov.

According to Bousquet et al. (2017): "The specimen from "West Spruce, 30 miles north of Westlock, Alberta" reported under the name *Phymatodes rainieri* Van Dyke by Swift and Ray (2010: 47) probably belongs to this species [*Phymatodes* sp. A = P. (*P.*) huetheri]." However, if the description by Swift and Ray (2010) is accurate, ("The pronotum and elytra are almost entirely glabrous and impunctate on the dorsal surface".), it cannot be P. (P.) huetheri.

Biology. Nothing is known about the host or biology of *Phymatodes* (*P.*) huetheri. Most all the New York specimens have been encountered or collected on top of Whiteface Mountain (Essex county) crawling on the exposed rock surface, where they were carried by the winds and dropped out as they met the opposing wind coming up the opposite side of the mountain (often referred to as "mountain topping"), or by beating or sweeping adjacent plants where they likely just landed. A specimen collected at Frampton, Québec (Gontran Drouin, personal communication) was taken sweeping low vegetation adjacent to coniferous logs. Other Canadian specimens were collected in Lindgren or "funnel" traps.

Phymatodes (*Phymatodes*) *huetheri* can be included in the alternative of couplet "27" from Swift and Ray (2010), modified:

Etymology. The new species is named for the collector of the holotype, Jeffrey P. Huether, who many years ago brought this species to the attention of the first author.

Acknowledgments

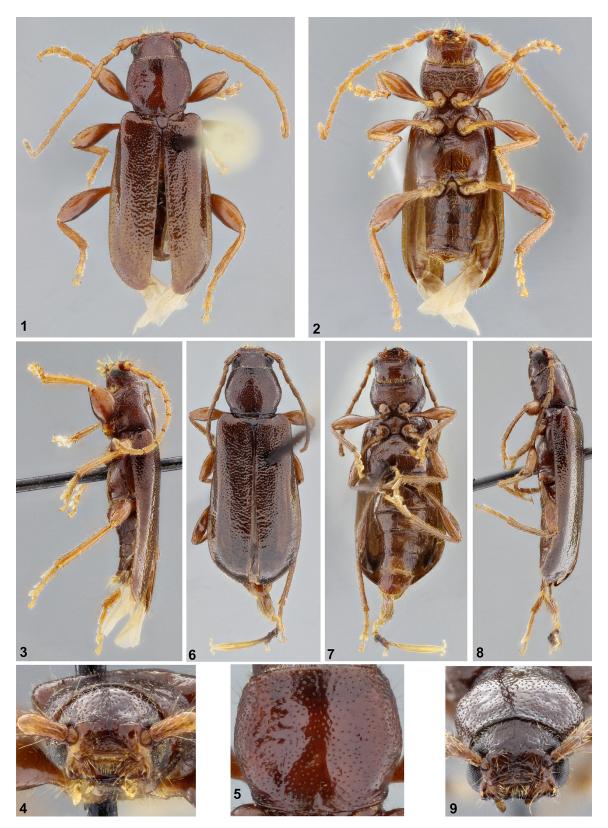
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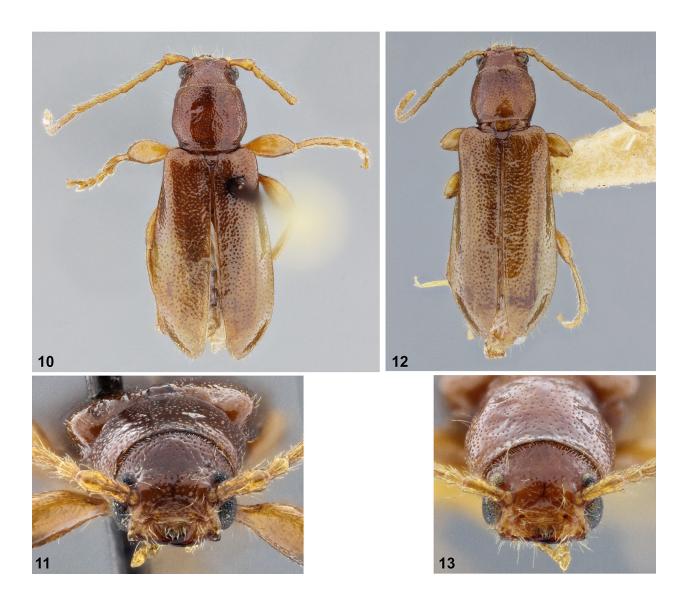
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Figures 1–9. Phymatodes (Phymatodes) huetheri. 1–5) Holotype male. 1) Dorsal habitus. 2) Ventral habitus. 3) Lateral habitus. 4) Head, frontal view. 5) Pronotum. 6–9) Paratype female. 6) Dorsal habitus. 7) Ventral habitus. 8) Lateral habitus. 9) Head, frontal view.



Figures 10–13. *Phymatodes (Phymatodes) huetheri*, paratypes. **10)** Male, dorsal habitus. **11)** Male, head, frontal view. **12)** Female, dorsal habitus. **13)** Female, head, frontal view.

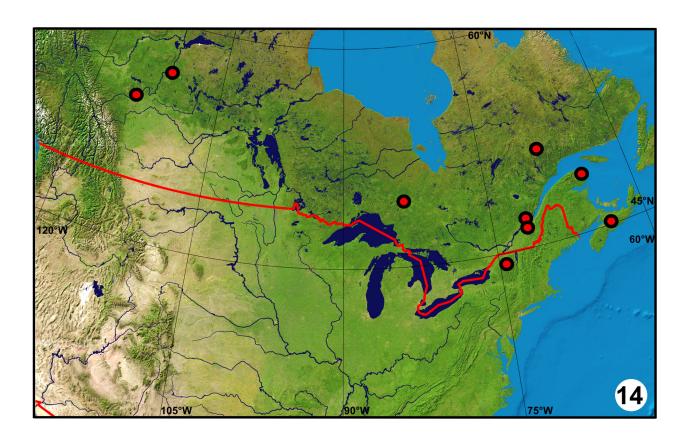


Figure 14. Known distribution of Phymatodes (Phymatodes) huetheri.