ZooKeys 309: 1–12 (2013)
doi: 10.3897/zookeys.309.5499
www.zookeys.org

RESEARCH ARTICLE

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Two new species of *Itagonia* Reitter (Coleoptera, Tenebrionidae, Blaptini) from China

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Academic editor: *Patrice Bouchard* | Received 9 May 2013 | Accepted 5 June 2013 | Published 13 June 2013

urn:lsid:zoobank.org:pub:996F5848-E505-4DC9-A055-F19361EDDFBE

Citation: Shi A (2013) Two new species of *Itagonia* Reitter (Coleoptera, Tenebrionidae, Blaptini) from Chinae. ZooKeys 309: 1–12. doi: 10.3897/zookeys.309.5499

Abstract

Two new species of *Itagonia* Reitter, 1887, *I. tibialis* **sp. n.** and *I. litangensis* **sp. n.** are described from Sichuan, China. A key to the known species of *Itagonia* from China is given.

Keywords

Coleoptera, Tenebrionidae, *Itagonia*, new species, identification key, Sichuan, China

Introduction

Itagonia Reitter, 1887 is among the most speciose genera in the subtribe Gnaptorinina of the tribe Blaptini. It comprises 19 species and one subspecies (Reitter 1887, 1889; Fairmaire 1888; Schuster 1914, 1923; Reinig 1931; Medvedev 1998, 2004; Shi and Ren, 2007a, 2007b; Egorov, 2007; Liu and Ren, 2009, Shi et al. 2010). Most of the species are restricted to the Hissaro-Darvaz Mountains (four species and one subspecies, representing 25% of the known taxa) and the eastern part of the Tibetan Plateau (thirteen species, representing 65% of the known taxa). *I. shamaevi* Medvedev, 2004 is known from Gansu and *I. provostii* (Fairmaire, 1888) from Beijing, Hebei, Neimenggu, Shaanxi and Ningxia (Fig. 1).

In this study, we follow the classification of Medvedev and Merkl (2002). Within the subtribe Gnaptorinina, the genus *Itagonia* is diagnosed by the following characters: upper edge of inner surface of profemur with tooth or obtuse-angled or arcuate prominence; upper spur of male protibiae larger than the lower spur, that of female protibiae massive, digitiform, the lower spur very small or invisible; apicale of aedeagus with outer margins arcuately or evenly narrowing to apex, or with outer margins slightly sinuate.

During the identification of tenebrionid specimens collected in Sichuan in 2012, two new species of the genus *Itagonia*, *I. tibialis* sp. n. from Jinchuan and *I. litangensis* sp. n. from Litang were found, which are described below.

Material and methods

All specimens were examined and measured under a Leica M205C stereomicroscope. Drawings of the new species were prepared under the same microscope equipped with a drawing tube. The photos were taken with a Canon PowerShot SX150IS digital camera. All specimens studied are deposited in the Museum of China West Normal University (MCWNU), Nanchong, China.

Taxonomy

Key to the species of the genus *Itagonia* from China

1 Upper edge of inner surface of profemur (figs 1–5 in Shi et al. 2010; Fig. 19) with tooth near apex **2**

– Upper edge of inner surface of profemur with arcuate or obtuse-angled prominence (figs 6–10, 14, 27, 40 in Shi et al. 2010; Fig. 33) near apex **8**

2 Outer margin of epipleura visible from above along or nearly along entire length **3**

– Outer margin of epipleura visible from above at most in anterior 1/2 and/or apex **4**

3 Tooth of profemur obtuse. Lateral margins of pronotum distinctly bordered before base. Apicale of aedeagus (Fig. 2) less elongate, 1.83 times as long as wide, with outer margins slightly sinuate near middle ..... ***I. szetschwana*** **Schuster, 1923**

– Tooth of profemur sharply acute-angled. Lateral margins of pronotum very finely, almost invisibly bordered. Apicale of aedeagus (Fig. 3) more elongate, 2.61 times as long as wide, with outer margins nearly straight ..... ***I. semenowi*** **Reitter, 1889**

4 Only apical part of outer margin of epipleura visible from above ..... ***I. shamaevi*** **Medvedev, 2004**

– At least part of anterior 1/2 of outer margin of epipleura visible from above... **5**

5 Each elytron with traces of two longitudinal carinae, dense granules and sparse irregular prominences. Inner surface of male protibiae with arcuate prominence near base ..... ***Itagonia tibialis* sp. n.**

– Elytra with punctures and wrinkles. Inner surface of male protibiae straight near base **6**

6 Pronotum more transverse, 1.40 times as wide as long, widest behind middle. Only plantar surface of protarsomere 1 with hair brush. Apicale of aedeagus (Fig. 4) with outer margins nearly straight .... ***I. provostii* (Fairmaire, 1888)**

– Pronotum less transverse, 1.15–1.24 times as wide as long, widest in middle. Plantar surface of protarsomeres 1 and 2 and mesotarsomere 1 with hair brushes. Apicale of aedeagus (Figs 5, 6) with outer margins sinuate **7**

7 Lateral margins of pronotum converging to base with almost straight line in basal half. Prosternum in front of procoxae oblique to horizontal plane. Metatibiae straight. Apicale of aedeagus (Fig. 5) with outer margins more sinuate near middle..... ***I. zayica* Shi & Ren, 2007**

– Lateral margins of pronotum almost parallel in basal half. Prosternum in front of procoxae almost vertical. Metatibiae weakly incurved. Apicale of aedeagus (Fig. 6) with outer margins less sinuate in apical 1/3 ..... ***I. baxoica* Liu & Ren, 2009**

8 Outer margin of epipleura visible from above along entire length **9**

– Outer margin of epipleura only partly visible from above **12**

9 Lateral margins of pronotum distinctly reflexed. Plantar surface of pro- and mesotarsomeres without hair brush or only plantar surface of protarsomere 1 with small hair brush. Apicale of aedeagus (Fig. 7) with outer margins weakly sinuate before middle..... ***I. elegans* Medvedev, 1998**

– Lateral margins of pronotum not reflexed. At least plantar surface of protarsomeres 1 and 2 with hair brushes. Apicale of aedeagus with outer margins weakly sinuate near middle (Fig. 8), smoothly converging from base to apex (Fig. 9) or sinuate in basal 1/3 (Fig. 10) **10**

10 Antennae longer, surpassing beyond pronotal base. Upper spur of protibiae slightly longer than the lower spur ..... ***I. longicornis* Shi & Ren, 2007**

– Antennae shorter, not reaching or reaching, but not surpassing pronotal base. Upper spur of protibiae significantly longer than the lower spur **11**

11 Anterior margin of pronotum more sinuate, lateral margins rectilinearly converging toward base in basal 1/2. Upper edge of inner surface of profemur with massive arcuate prominence near apex. Plantar surface of mesotarsomere 1 with apical tuft of light setae. Apicale of aedeagus (Fig. 9) with outer margins smoothly converging from base to apex ..... ***I. bisetosa* Medvedev, 1998**

– Anterior margin of pronotum less sinuate, lateral margins slightly sinuate in basal 1/4. Upper edge of inner surface of profemur with obtuse-angled prominence near apex. Plantar surface of mesotarsomere 1 with small hair brush. Apicale of aedeagus (Fig. 10) with outer margins sinuate in basal 1/3, and apical part regularly narrowing towards apex ..... ***I. xinlongensis* Shi et al., 2010**

12 Plantar surface of protarsomeres 1 and 2 with hair brushes or apical tuft of pale hairs **13**

– Plantar surface of protarsomeres 1 to 3 with hair brushes..... **14**

13 Pronotum widest before base, lateral margins less arcuately protruding. Elytral surface coarse, with irregular prominences and very sparse punctures. Plantar surface of mesotarsomere 1 with hair brush. Apicale of aedeagus (Fig. 11) less elongate, 1.46 times as long as wide, with outer margins smoothly converging from base to apex..... ***I. tuberculata*** **Shi et al., 2010**

– Pronotum widest before middle, lateral margins more arcuately protruding. Elytral surface smooth, with fine punctures and irregular wrinkles. Plantar surface of mesotarsomere 1 with apical tuft of pale hairs. Apicale of aedeagus (Fig. 12) more elongate, 2.0 times as long as wide, with outer margins sinuate in basal 1/4 ..... ***I. cordiformis*** **Shi & Ren, 2007**

14 Anterior 2/3 or only apical part of outer margin of epipleura visible from above **15**

– Less than anterior 1/2 of outer margin of epipleura visible from above **16**

15 Pronotal surface not flattened along outer margins. Outer margin of epipleura in dorsal view concealed by outer convexity of elytra only in apical 1/3. Apicale of aedeagus (Fig. 13) with outer margins smoothly converging from base to apex. Body significantly smaller, length 9.6 mm..... ***I. trisetosa*** **Medvedev, 1998**

– Pronotal surface widely flattened along outer margins in basal half. Outer margin of epipleura visible from above only in apex. Apicale of aedeagus (Fig. 14) with outer margins slightly sinuate in apical part. Body large, length 10.8–11.7 mm..... ***I. mera*** **Medvedev, 1998**

16 Prosternum in front of procoxae oblique to horizontal plane. Apical part of outer margin of epipleura visible from above. Upper spur of protibiae massive, longer than protarsomere 1. Plantar surface of mesotarsomere without hair brush. Apicale of aedeagus (Fig. 15) 1.51 times as long as wide .... ***I. medvedevi*** **Shi et al., 2010**

– Prosternum in front of procoxae steeply sloping. Apical part of outer margin of epipleura invisible from above. Upper spur of protibiae not massive, shorter than protarsomere 1. Plantar surface of mesotarsomeres 1 to 2 with hair brushes. Apicale of aedeagus (Fig. 36) 1.43 times as long as wide ..... ***I. litangensis*** **sp. n.**

Itagonia tibialis **sp. n.**
urn:lsid:zoobank.org:act:0A1C342C-D3B4-44D7-B98A-D96D08FC5720
http://species-id.net/wiki/Itagonia_tibialis
Figs 16–29, 44–45

Type material. Holotype male: China, Sichuan, Jinchuan, 31°29'N, 102°05'E, 2647 m, 31 Jul. 2012, Y. C. Li and Y. P. Lai leg. (MCWNU). Paratypes: 9 males and 5 females, same data as the holotype (MCWNU).

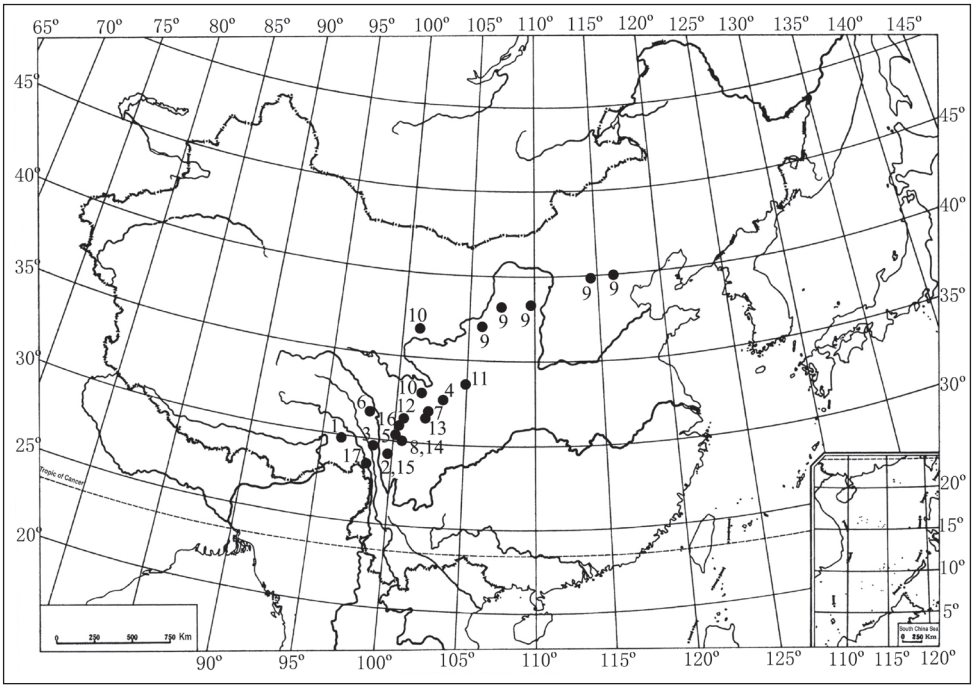


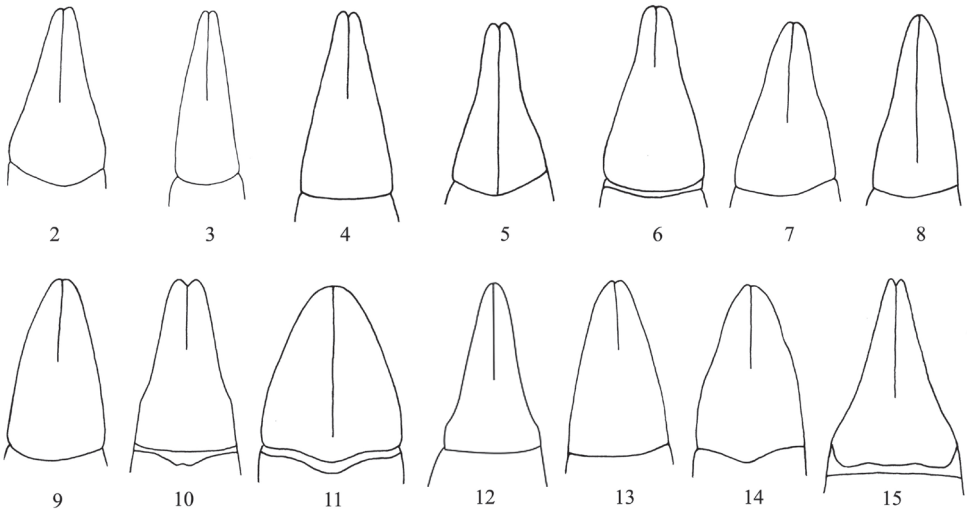
Figure 1. Distribution of species of the genus *Itagonia* Reitter from China: **1** *I. baxoica* Liu & Ren, 2009 **2** *I. bisetosa* Medvedev, 1998 **3** *I. cordiformis* Shi & Ren, 2007 **4** *I. elegans* Medvedev, 1998 **5** *I. litangensis* sp. n. **6** *I. longicornis* Shi & Ren, 2007 **7** *I. medvedevi* Shi et al., 2010 **8** *I. mera* Medvedev, 1998 **9** *I. provostii* Fairmaire, 1888 **10** *I. semenovi* Reitter, 1889 **11** *I. shamaevi* Medvedev, 2004 **12** *I. szetschwana* Schuster, 1923 **13** *I. tibialis* sp. n. **14** *I. trisetosa* Medvedev, 1998 **15** *I. tuberculata* Shi et al., 2010 **16** *I. xinlongensis* Shi et al., 2010 **17** *I. zayica* Shi & Ren, 2007

Diagnosis. This new species can be distinguished from other *Itagonia* species by the following differences: each elytron with traces of two longitudinal carinae; inner surface of male protibiae with arcuate prominence near base. *I. tibialis* sp. n. belongs to the group including also *I. bisetosa* Medvedev, 1998, *I. tuberculata* Shi et al., 2010 and *I. trisetosa* Medvedev, 1998. Representatives of this group differ from other *Itagonia* species in having apicale of aedeagus flat, smoothly tapering from base to apex, forming no sharp narrowing in apical part (Figs 9, 11, 13, 22). Occurring together with *I. bisetosa*, *I. tuberculata* and *I. trisetosa*, the new species can be distinguished by upper edge of inner surface of profemur forming in apical part rectangular tooth. Also, the described species sharply differs from *I. bisetosa* and *I. trisetosa* in having less than anterior 1/2 of outer margin of epipleura visible from above, and from *I. tuberculata* in having the pronotum widest before middle.

Etymology. Named after the protibiae of male, inner surface of which has an arcuate prominence near base. This sharply differs from those of other species of *Itagonia*.

Description. Body black, elytra dull, other parts of body weakly shining.

Male (Figs 16, 18–26). Anterior margin of clypeus weakly sinuate. Lateral margin of head almost without incision above antennal base. Genal margin parallel before

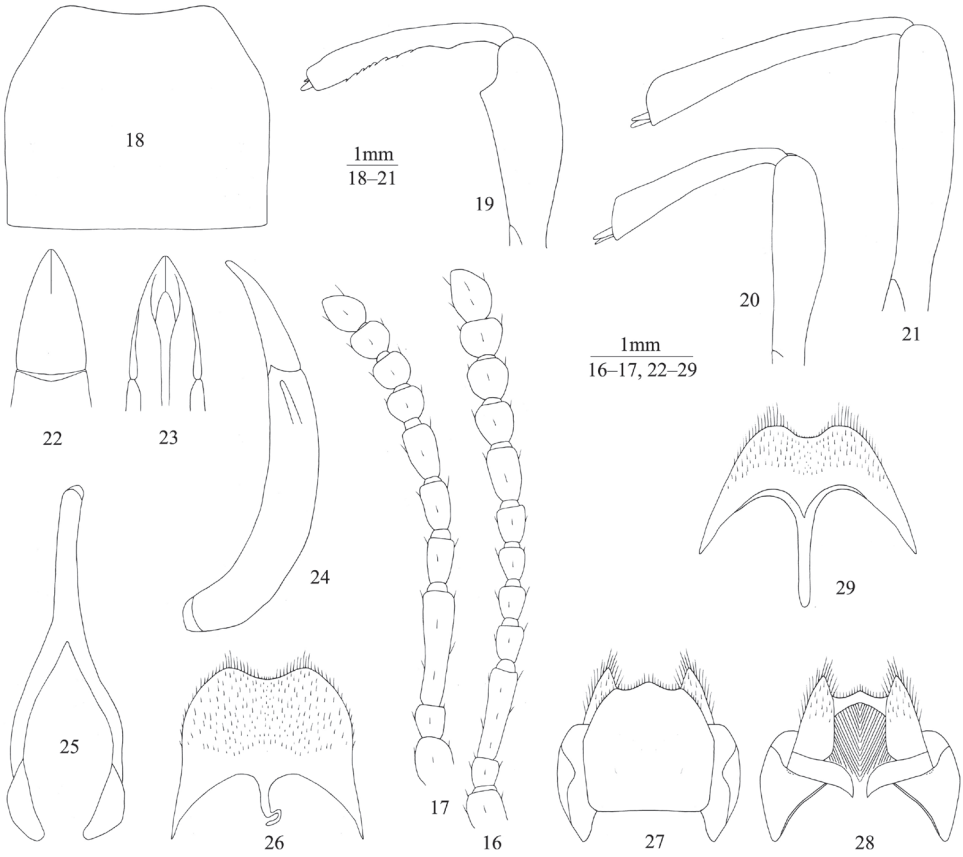


Figures 2–15. Apicale of aedeagus in dorsal view. **2** *I. szetschwana* Schuster, 1923 **3** *I. semenowi* Reitter, 1889 **4** *I. provostii* (Fairmaire, 1888) **5** *I. zayica* Shi & Ren, 2007 **6** *I. baxoica* Liu & Ren, 2009 **7** *I. elegans* Medvedev, 1998 **8** *I. longicornis* Shi & Ren, 2007 **9** *I. bisetosa* Medvedev, 1998 **10** *I. xinlongensis* Shi et al., 2010 **11** *I. tuberculata* Shi et al., 2010 **12** *I. cordiformis* Shi & Ren, 2007 **13** *I. trisetosa* Medvedev, 1998 **14** *I. mera* Medvedev, 1998 **15** *I. medvedevi* Shi et al., 2010. (figs 2–3 from Medvedev 2001; figs 4 and 6 from from Liu and Ren 2009; figs 7, 9 and 13–14 from Medvedev 1998)

eyes. Eyes not protruding beyond contour of head. Vertex slightly convex or flat, with moderately dense punctures. Frontoclypeal suture very shallow or invisible. Antennae (Fig. 16) reaching or nearly reaching pronotal base. Length (width) ratio of antennomeres 2 to 11 as follows: 18(17): 67(18): 25(16): 27(17): 31(18): 31(18): 23(22): 22(24): 21(25): 31(23).

Pronotum (Fig. 18) 1.15–1.24 (1.19 on average, n=10) times as wide as long, maximum width before middle, 1.63–1.77 (1.68 on average, n=10) times as wide as head. Ratio of pronotal width at anterior margin to its maximum width and width at base (n=10) 0.55: 1.00: 0.94 on average. Lateral margins of pronotum sharply arcuately converging to anterior margin in anterior 1/3, slightly narrowing to base in basal half or nearly parallel in basal 1/4, entirely bordered. Anterior margin of pronotum weakly sinuate, bordered laterally; base straight, not bordered. Anterior angles of pronotum weakly obtuse, rounded apically; posterior ones weakly obtuse or nearly rectangular. Pronotal surface between lateral margins weakly convex, with shallow median depression at disc; punctures as large as those on head, fine at disc center and larger laterally. Propleura concave in basal half, with wrinkles and very sparse granules. Prosternum in front of procoxae gently sloping; intercoxal process with shallow median depression, steeply sloping behind procoxae.

Elytra elongate-oval, 1.56–1.65 (1.60 on average, n=10) times as long as wide, maximum width in anterior 1/3, 1.35–1.44 (1.41 on average, n=10) times as wide as pronotum. Less than anterior 1/2 of outer margin of epipleura visible from above.



Figures 16–29. *Itagonia tibialis* sp. n. **16** antenna of male **17** antenna of female **18** pronotum of male **19** profemur and protibiae of male **20** mesofemur and mesotibiae of male **21** mtafemur and metatibiae of male **22–23** apicale of aedeagus in dorsal and ventral views **24** aedeagus in lateral view **25** spiculum gastrale **26** abdominal ventrite 8 of male **27–28** ovipositor in dorsal and ventral views **29** spiculum ventrale.

Elytral surface between epipleura and sutural margin convex. Each elytron with traces of 2 longitudinal carinae, dense granules and sparse irregular prominences. Epipleural surface smooth, with sparse wrinkles and very sparse granules. Abdominal ventrites with punctures and short brown setae, abdominal ventrites 1 to 3 with longitudinal wrinkles, basal two abdominal ventrites with concave impression in middle.

Legs (Figs 19–21) moderately robust, length (width) ratio of pro-, meso- and metafemora 74(26): 74(19): 100(21); tibiae: 70(11): 63(13): 95(14). Upper edge of inner surface of profemur with rectangular tooth in apical part. Inner surface of protibiae with arcuate prominence near base. Upper spur of protibiae not very massive, shorter than protarsomere 1, lower spur fine and pointed. Plantar surface of protarsomeres 1 and 2 and mesotarsomere 1 with hair brushes. Metatibiae weakly incurved, regularly widening apicad. Length (width) ratio of metatarsomeres 1 to 4 as follows: 25(6.4): 12(6.0): 12(5.7): 22(6.4).

Aedeagus (Figs 22–24): length 3.83 mm, width 0.79 mm. Apicale 1.33 mm long and 0.70 mm wide, with outer margins arcuately narrowing to apex. Spiculum gastrale as in Fig. 25. Apical margin of abdominal ventrite 8 sinuate (Fig. 26).

Female (Figs 17, 27–29). Body wider. Antennae (Fig. 17) shorter than in male. Pronotum 1.24–1.33 (1.28 on average, n=5) times as wide as long. Elytra 1.41–1.48 (1.44 on average, n=5) times as long as wide. Less than anterior 1/3 of outer margin of epipleura visible from above. Protibiae nearly straight. Upper spur of protibiae massive and rounded apically; lower spur fine. Metatibiae straight. Plantar surface of protarsomeres and mesotarsomeres without brush. Ovipositor as in Figs 27–28. Spiculum ventrale as in Fig. 29.

Measurements. Male body length 13.4–15.1 mm, width 5.4–6.3 mm; female body length 13.8–15.6 mm, width 6.7–7.2 mm.

***Itagonia litangensis* sp. n.**
urn:lsid:zoobank.org:act:6964C433-F497-425E-A637-4D06DD365417
http://species-id.net/wiki/Itagonia_litangensis
Figs 30–43, 46–47

Type material. Holotype male: China, Sichuan, Litang, 30°18'N, 100°16'E, 3410 m, 2 Aug. 2012, A. M. Shi leg. (MCWNU). Paratypes: 5 males and 4 females, same data as the holotype (MCWNU).

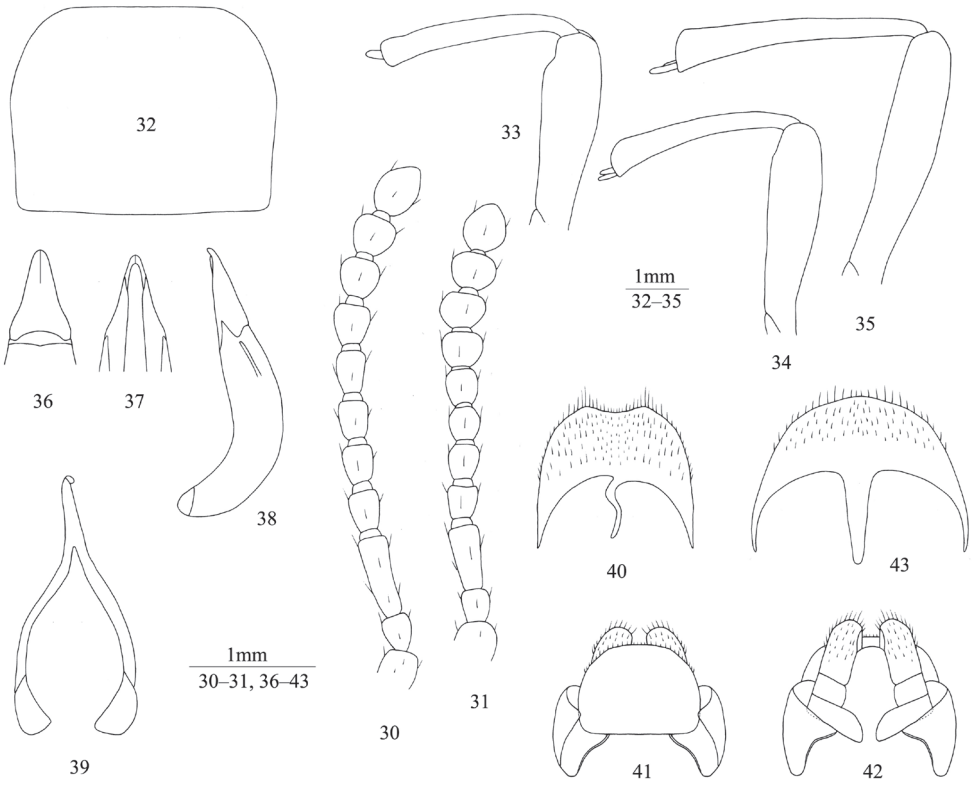
Diagnosis. The new species resembles *Itagonia medvedevi* Shi et al., 2010 and *I. cordiformis* Shi & Ren, 2007 by less than anterior 1/2 of outer margin of epipleura visible from above and apicale of aedeagus with outer margins sinuate, apical part rather sharply narrowing apicad (Figs 12, 15, 36). *I. litangensis* sp. n. differs from *I. medvedevi* and *I. cordiformis* in having the prosternum in front of procoxae steeply sloping; upper spur of protibiae not massive, shorter than protarsomere 1; plantar surface of mesotarsomeres 1 to 2 with hair brushes; apical margin of abdominal sternite 8 weakly sinuate. Also, the new species can be distinguished from *I. medvedevi* by apical part of outer margin of epipleura invisible from above, and from *I. cordiformis* by lateral margins of pronotum weakly arcuately protruding.

Etymology. Named after the type locality, Litang.

Description. Body black, weakly shining.

Male (Figs 30, 32–40). Anterior margin of clypeus nearly straight. Lateral margin of head with obtuse-angled shallow incision above antennal base. Genal margin arcuately converging to clypeal base. Eyes not protruding beyond contour of head. Vertex slightly convex, with moderately dense punctures. Frontoclypeal suture shallow. Antennae (Fig. 30) reaching posterior 1/4 of pronotum. Length (width) ratio of antennomeres 2 to 11 as follows: 16(13): 33(14): 18(14): 18(14): 18(14): 20(14): 18(17): 18(19): 18(20): 25(19).

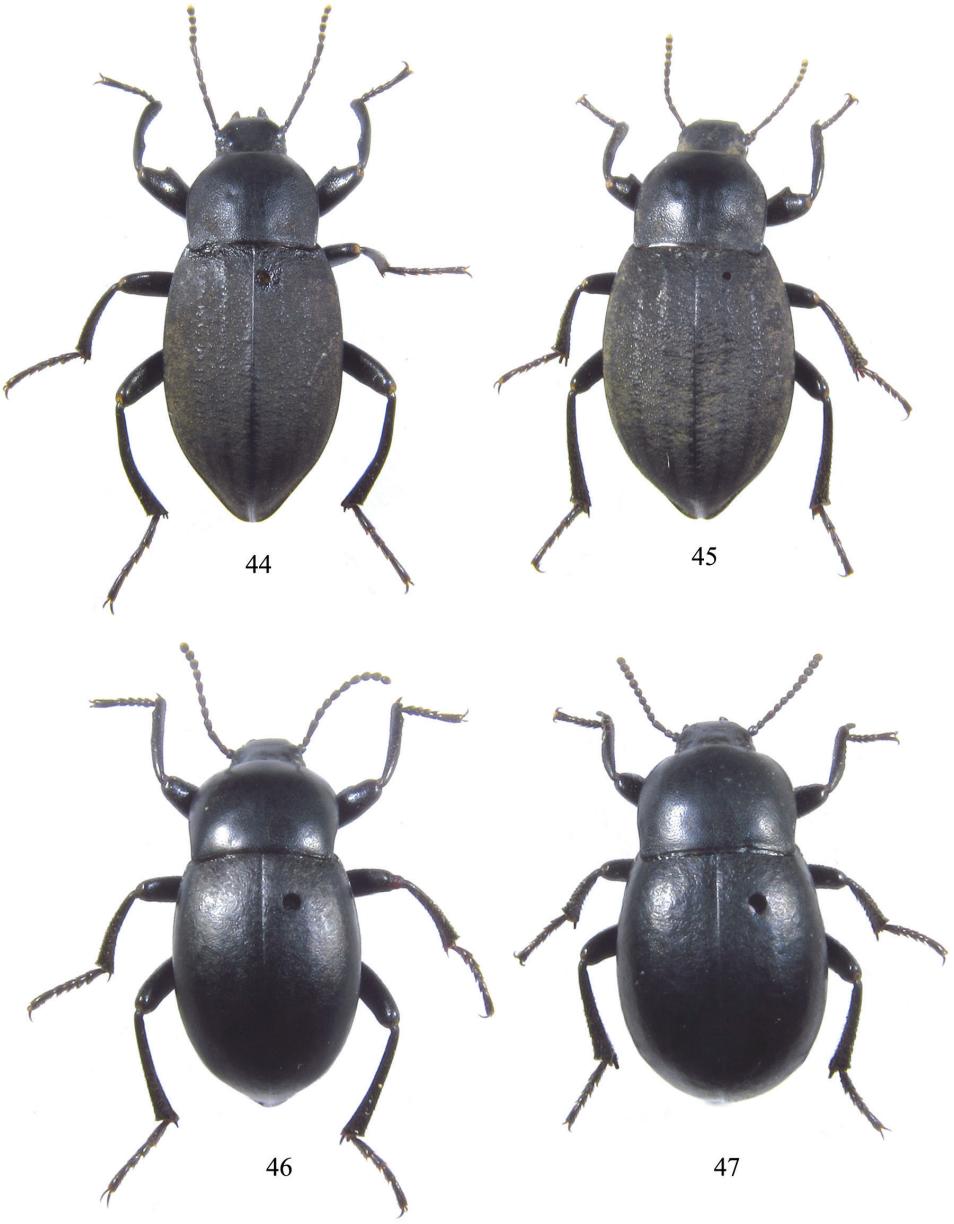
Pronotum (Fig. 32) transverse, 1.25–1.35 (1.28 on average, n=6) times as wide as long, maximum width before middle, 1.77–1.86 (1.84 on average, n=6) times



Figures 30–43. *Itagonia litangensis* sp. n. **30** antenna of male **31** antenna of female **32** pronotum of male **33** profemur and protibiae of male **34** mesofemur and mesotibiae of male **35** mtafemur and metatibiae of male **36–37** apicale of aedeagus in dorsal and ventral views **38** aedeagus in lateral view **39** spiculum gastrale **40** abdominal ventrite 8 of male **41–42** ovipositor in dorsal and ventral views **43** spiculum ventrale.

as wide as head. Ratio of pronotal width at anterior margin to its maximum width and width at base (n=6) 0.67: 1.00: 0.91 on average. Lateral margins of pronotum more sharply arcuately narrowing to anterior margin than to base, entirely bordered. Anterior margin of pronotum nearly straight; base straight, both bordered laterally. Anterior angles of pronotum obtuse, rounded apically; posterior ones weakly obtuse. Pronotal surface between lateral margins convex, with short median depression at disc; punctures as large as those on head, fine at disc center and larger laterally. Propleura slightly concave, with wrinkles and very sparse granules. Prosternum in front of procoxae steeply sloping; intercoxal process with shallow median depression, steeply sloping behind procoxae.

Elytra elongate-oval, 1.35–1.42 (1.39 on average, n=6) times as long as wide, maximum width before middle, 1.21–1.31 (1.25 on average, n=6) times as wide as pronotum. Less than anterior 1/2 of outer margin of epipleura visible from above. Elytral surface between outer margin of epipleura and sutural margin convex, sparsely covered with irregular fine wrinkles and fine punctures. Epipleural surface with sparse



Figures 44–47. 44–45 *Itagonia tibialis* sp. n. **44** male, length 14.2 mm **45** female, length 14.9 mm **46–47** *I. litangensis* sp. n. **46** male, length 11.5 mm **47** female, length 11.8 mm.

wrinkles. Abdominal ventrites with punctures and brown setae, abdominal ventrites 1 to 3 with longitudinal wrinkles.

Legs (Figs 33–35) robust, length (width) ratio of pro-, meso- and metafemora 78(22): 82(20): 100(21); tibiae: 74(11): 71(12): 94(16). Upper spur of protibiae not

massive, shorter than protarsomere 1, lower spur fine and pointed. Plantar surface of protarsomeres 1 to 3 and mesotarsomeres 1 to 2 with hair brushes. Metatibiae weakly incurved. Length (width) ratio of metatarsomeres 1 to 4 as follows: 24(8.0): 13(7.5): 12(6.7): 25(6.7).

Aedeagus (Figs 36–38): length 2.24 mm, width 0.71 mm. Apicale 0.69 mm long and 0.48 mm wide, with outer margins slightly sinuate in basal 1/3. Spiculum gastrale as in Fig. 39. Apical margin of abdominal ventrite 8 weakly sinuate (Fig. 40).

Female (Figs 31, 41–43). Body wider. Antennae (Fig. 31) shorter than in male. Pronotum 1.27–1.35 (1.32 on average, n=4) times as wide as long. Elytra 1.27–1.35 (1.31 on average, n=4) times as long as wide. Less than anterior 1/3 of outer margin of epipleura visible from above. Upper spur of protibiae massive and rounded apically; lower spur missing. Plantar surface of protarsomeres and mesotarsomeres without brush. Ovipositor as in Figs 41–42. Spiculum ventrale as in Fig. 43.

Measurements. Male body length 11.0–12.2 mm, width 5.2–5.8 mm; female body length 11.4–12.1 mm, width 5.6–6.1 mm.

Acknowledgements

I'm grateful to Yun-chun Li (China West Normal University) and Yong-ping Lai (China West Normal University) for their collaboration on the field trip. I think Wolfgang Schawaller and Otto Merkl for their comments which helped to improve my manuscript. This study is supported by the Key Research Project of the Sichuan Province Education Department of China (10ZA023) and Sichuan Key Provincial Discipline (SZD0420).

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ZooKeys 309 13–48 (2013)
doi: 10.3897/zookeys.309.4667
www.zookeys.org

RESEARCH ARTICLE

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New Curculionoidea (Coleoptera) records for Canada

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Academic editor: *Christopher Majka* | Received 11 January 2013 | Accepted 15 May 2013 | Published 13 June 2013

Citation: Douglas H, Bouchard P, Anderson RS, de Tonnancour P, Vigneault R, Webster RP (2013) New Curculionoidea (Coleoptera) records for Canada. ZooKeys 309: 13–48. doi: 10.3897/zookeys.309.4667

Abstract

The following species of Curculionoidea are recorded from Canada for the first time, in ten cases also representing new records at the generic level: *Ischnopterapion* (*Ischnopterapion*) *loti* (Kirby, 1808); *Stenopterapion meliloti* (Kirby, 1808) (both Brentidae); *Atrichonotus taeniatulus* (Berg, 1881); *Barinus cribricollis* (LeConte, 1876); *Caulophilus dubius* (Horn, 1873); *Cionus scrophulariae* (Linnaeus, 1758); *Cryptorhynchus tristis* LeConte, 1876; *Cylindrocopturus furnissi* Buchanan, 1940; *Cylindrocopturus quercus* (Say, 1832); *Desmoglyptus crenatus* (LeConte, 1876); *Pnigodes setosus* LeConte, 1876; *Pseudopentarthrum parvicollis* (Casey, 1892); *Sibariops confinis* (LeConte, 1876); *Sibariops confusus* (Boheman, 1836); *Smicronyx griseus* LeConte, 1876; *Smicronyx lineolatus* Casey, 1892; *Euwallacea validus* (Eichhoff, 1875); *Hylocurus rudis* (LeConte, 1876); *Lymantor alaskanus* Wood, 1978; *Phloeotribus scabricollis* (Hopkins, 1916); *Scolytus oregoni* Blackman, 1934; *Xyleborus celsus* Eichhoff, 1868; *Xyleborus ferrugineus* (Fabricius, 1801); *Xylosandrus crassiusculus* (Motschulsky, 1866) (all Curculionidae). In addition the following species were recorded for the first time from these provinces and territories: Yukon – *Dendroctonus simplex* LeConte, 1868; *Phloetribus piceae* Swaine, 1911 (both Curculionidae); Northwest Territories – *Loborhynchapion cyanitinctum* (Fall, 1927) (Brentidae); Nunavut – *Dendroctonus simplex* LeConte, 1868 (Curculionidae); Alberta – *Anthonomus tectus* LeConte, 1876; *Promecotarsus densus* Casey, 1892; *Dendroctonus ponderosae* Hopkins, 1902; *Hylastes macer* LeConte, 1868; *Rhyncolus knowltoni* (Thatcher, 1940); *Scolytus schevyrewi* Semenov Tjan-Shansky, 1902 (all Curculionidae); Saskatchewan – *Phloeotribus liminaris* (Harris, 1852); *Rhyncolus knowltoni* (Thatcher, 1940); *Scolytus schevyrewi* Semenov Tjan-Shansky, 1902 (all Curculionidae); Manitoba – *Cosmobaris scolopacea* Germar, 1819; *Listronotus maculicollis* (Kirby, 1837); *Listronotus punctiger* LeConte, 1876;

Scolytus schevyrewi Semenov Tjan-Shansky, 1902; *Tyloderma foveolatum* (Say, 1832); (all Curculionidae); Ontario – *Trichapion nigrum* (Herbst, 1797); *Nanophyes marmoratus marmoratus* (Goeze, 1777) (both Brentidae); *Asperosoma echinatum* (Fall, 1917); *Micracis suturalis* LeConte, 1868; *Orchestes alni* (Linnaeus, 1758); *Phloeosinus pini* Swaine, 1915; *Scolytus schevyrewi* Semenov Tjan-Shansky, 1902; *Xyleborinus attenuatus* (Blandford, 1894) (all Curculionidae); Quebec – *Trigonorhinus alternatus* (Say, 1826); *Trigonorhinus tomentosus tomentosus* (Say, 1826) (both Anthribidae); *Trichapion nigrum* (Herbst, 1797); *Trichapion porcatum* (Boheman, 1839); *Nanophyes marmoratus marmoratus* (Goeze, 1777) (all Brentidae); *Lissorhoptrus oryzophilus* Kuschel, 1952 (Brachyceridae); *Acalles carinatus* LeConte, 1876; *Ampeloglypter ampelopsis* (Riley, 1869); *Anthonomus rufipes* LeConte, 1876; *Anthonomus suturalis* LeConte, 1824; *Ceutorhynchus hamiltoni* Dietz, 1896; *Curculio pardalis* (Chittenden, 1908); *Cyrtepistomus castaneus* (Roelofs, 1873); *Larinus planus* (Fabricius, 1792); *Mecinus janthinus* (Germar, 1821); *Microhyus setiger* LeConte, 1876; *Microplontus campestris* (Gyllenhal, 1837); *Orchestes alni* (Linnaeus, 1758); *Otiorhynchus ligustici* (Linnaeus, 1758); *Rhinusa neta* (Germar, 1821); *Trichobaris trinotata* (Say, 1832); *Tychius liljebladi* Blatchley, 1916; *Xyleborinus attenuatus* (Blandford, 1894); *Xyleborus affinis* Eichhoff, 1868 (all Curculionidae); *Sphenophorus incongruus* Chittenden, 1905 (Dryophthoridae); New Brunswick – *Euparius paganus* Gyllenhal, 1833; *Allandrus populi* Pierce, 1930; *Gonotropis dorsalis* (Thunberg, 1796); *Euxenus punctatus* LeConte, 1876 (all Anthribidae); *Loborhynchapion cyanitinctum* (Fall, 1927) (Brentidae); *Pseudanthonomus seriesetosus* Dietz, 1891; *Curculio sulcatulus* (Casey, 1897); *Lignyodes bischoffi* (Blatchley, 1916); *Lignyodes horridulus* (Casey, 1892); *Dietzella zimmermanni* (Gyllenhal, 1837); *Parenthis vestitus* Dietz, 1896; *Pelenomus squamosus* LeConte, 1876; *Psomus armatus* Dietz, 1891; *Rhyncolus macrops* Buchanan, 1946; *Magdalis inconspicua* Horn, 1873; *Magdalis salicis* Horn, 1873 (all Curculionidae); Nova Scotia – *Dryocoetes autographus* (Ratzeburg, 1837); *Ips perroti* Swaine, 1915; *Xyleborinus attenuatus* (Blandford, 1894) (all Curculionidae); Prince Edward Island – *Dryocoetes caryi* Hopkins, 1915 (Curculionidae); Newfoundland – *Scolytus piceae* (Swaine, 1910) (Curculionidae).

Published records of *Dendroctonus simplex* LeConte, 1868 from Northwest Territories should be reassigned to Nunavut, leaving no documented record for NWT. Collection data are provided for eight provincial and national records published without further information previously.

Keywords
Anthribidae, Brachyceridae, Brentidae, Curculionidae, Dyophthoridae, weevils, bark beetles, pests

Introduction

Routine weevil and bark beetle identifications from plant health surveys, amateur collectors, public inquiries, and museum survey specimens regularly produce new faunal records for Canada, its provinces, and territories. The most recent checklist of the Canadian fauna is McNamara (1991).

The present article presents new findings with associated collection data so that the records may be documented with verifiable voucher specimens. These records are also reflected in the updated checklist of Canadian beetles (Bousquet et al. 2013). The following list of 97 new records are organised according to the family–group classification of Bouchard et al. (2011). We record two Brentidae, and 22 Curculionidae species new to Canada, and 72 new provincial and territorial records; many of these are of beneficial or economic pest species.

Materials and methods

Specimens were identified (or identifications confirmed) by recognized specialists in those taxa. These are as follows: Curculionidae (Scolytinae) (Hume Douglas, Donald E. Bright); Curculionidae (other than Scolytinae), Anthribidae, Brachyceridae (Robert S. Anderson, Patrice Bouchard); Brentidae (Apioninae) and Curculionidae (Baridinae) (Jens Prena). Specimens are deposited in collections listed with the specimen data for each species.

All collections listed below were reviewed by one or more authors for undocumented curculionoid records except for DEBU, GLFC, and City of Saskatoon. For these three collections we included only the specimens identified as new by their staff. It is possible that additional undocumented curculionoid records remain in most of the collections listed below.

The use of term adventive used here follows that of Wheeler and Hoebeke (2009). Such adventive species are non-natives with established North American populations, intentionally or accidentally introduced by humans, effectively since the first arrival of Europeans.

Canadian collections that provided material cited here:

AFC Atlantic Forestry Centre, Natural Resources Canada, Canadian Forest Service, Fredericton, New Brunswick

CCCH Claude Chantal Insect Collection (personal collection), Varennes, Quebec

City of Saskatoon Saskatchewan (Contact Jeff Boone)

CHMS Henri Miquet-Sage Insect Collection (personal collection), Mont-Saint-Hilaire, Quebec

CMNC Canadian Museum of Nature, Ottawa, Ontario

CNCI Canadian National Collection of Insects, Arachnids, and Nematodes, Agriculture and Agri-Food Canada Research Centre, Ottawa, Ontario

CPTO Pierre de Tonnancour Insect Collection (personal collection), Terrasse-Vaudreuil, Quebec

CRLI René Limoges Insect Collection (personal collection), Montreal, Quebec

CRVI Robert Vigneault Insect Collection (personal collection), Oka, Quebec

CSLA Serge Laplante Insect Collection (personal collection), Gatineau, Quebec

DEBU University of Guelph Insect Collection, Guelph, Ontario

GLFC Great Lakes Forestry Centre, Sault Ste. Marie, Ontario

LEMQ Lyman Entomological Museum, McGill University, Ste-Anne-de-Bellevue, Quebec

NBM New Brunswick Museum, Saint John, New Brunswick

RWC Reginald P. Webster Collection (personal collection), Charters Settlement, New Brunswick

Results

1) Family Anthribidae Billberg, 1820
Subfamily Anthribinae Billberg, 1820
Tribe Cratoparini LeConte, 1876

***Euparius paganus* Gyllenhal, 1833, new to New Brunswick, and new data supporting first records for Canada**

Note. This native fungus weevil was recorded "from Quebec to Florida, west to Iowa, Kansas and Texas" by Valentine (1999) without specific details about its distribution within Quebec. We provide those data here for the first time and provide data for specimens from New Brunswick.

Specimen data. New Brunswick: Carleton County, Jackson Falls, Bell Forest, 46.2200°N, 67.7231°W, 17–31.vii.2012, 31.vii-14.viii.2012, C. Alderson & V. Webster, Lindgren traps in canopy of *Juglans cinerea* and *Tilia americana* (1, AFC; 5, RWC). **Quebec:** MRC Vaudreuil-Soulanges, Rigaud, 12.vii, 14.vii.1998 (2, CRVI); MRC Deux-Montagnes, Oka, Mont St-Pierre, 19.v., 2.viii.2003, UV Light, R. Vigneault (2, CRVI); MRC Les Collines-de-l'Outaouais, Eardley, "petite colline d'Eardley", 17.vi., 25.vii.2003, 14.v.2004, S. Laplante, R. Vigneault, at UV light (3, CSLA; 2 CRVI); MRC Les Collines-de-l'Outaouais, Eardley, "petite colline d'Eardley", 25.vii.2003, S. Laplante, on dead branch of *Prunus pensylvanica* at night (1, CSLA); MRC Vaudreuil-Soulanges, Terrasse-Vaudreuil, 3.vii.2011 (01:00), white and UV lights, P. de Tonnancour (1, CPTO); MRC Vaudreuil-Soulanges, Terrasse-Vaudreuil, 5.vii.2012 (23:00), white and UV lights, P. de Tonnancour (1, CPTO); MRC Vaudreuil-Soulanges, Terrasse-Vaudreuil, 27.vii.2012, at night (22:30), white and mercury lights, P. de Tonnancour (1, CPTO).

Tribe Stenocerini Kolbe, 1895

***Allandrus populi* Pierce, 1930, new to New Brunswick**

Note. This transcontinental Canadian species appears to be associated with *Populus tremuloides* (Bright 1993).

Specimen data. New Brunswick: Carleton County, Meduxnekeag Valley Nature Preserve, 46.1907°N, 67.6740°W, 3–17.vii.2012, C. Alderson & V. Webster, Lindgren trap in *Populus tremuloides* canopy (3, AFC; 3, RWC); Sunbury County, Gilbert Island, 45.8770°N, 66.2954°W, 11–29.vi–11.2012, 11–25.vii.2012, 25.vii–8.viii.2012, 8–21.viii.2012 Lindgren traps in *Populus tremuloides* canopy, C. Alderson, C. Hughes & V. Webster (4, AFC; 1, NBM; 5, RWC); York County, 15 km W of Tracy, off Rt. 645, 45.6848°N, 66.8821°W, 16–30.vi.2010, Lindgren funnel trap, R. Webster & C. MacKay (1, RWC).

Tribe Trigonorhinini Valentine, 1999

***Trigonorhinus alternatus* (Say, 1826), new to Quebec**

Note. This fungus weevil was recorded in Canada from Alberta, Manitoba and Ontario by McNamara (1991).

Specimen data. Quebec: MRC Marguerite-D'Youville, Varennes (Verchères), 6.vi.2003, C. Chantal (1, CCCH).

***Trigonorhinus tomentosus tomentosus* (Say, 1826), new to Quebec**

Note. This native species was only recorded in Canada from Ontario by McNamara (1991).

Specimen data. Quebec: Montreal, 23.vii.1967, E. J. Kiteley (1, CNCI); Montreal, Sainte- Anne-de-Bellevue, 5.ix.1967, W. Boyle (1, LEMQ; 1, CMNC); Montreal, 21.viii.1968 (1, CNCI); Montreal, 26.viii.1968 (2, CNCI); MRC Vaudreuil-Soulanges, Rigaud (4 mi. S.E.), 4.vii.1972, C. Boyle (1, LEMQ); RCM Le Haut-Saint-Laurent, Cairnside, 29.viii.1981 (1, CNCI); MRC Vaudreuil-Soulanges, Notre-Dame-de-l'Île-Perrot, 27.v.2011 (13:00), 10.vi.2011 (17:00), 2.vii.2011 (15:00), swept from grasses, swept from *Scirpus* sp., ex. flowers of *Lythrum salicaria*, P. de Tonnancour (5, CPTO); Montreal, Sainte-Anne-de-Bellevue, 24.viii.2011 (13:00), swept from *Ambrosia artemisiifolia*, P. de Tonnancour (3, CPTO); Montreal, Sainte-Anne-de-Bellevue, 12.ix.2011 (12:00), swept from *Ambrosia artemisiifolia*, P. de Tonnancour (1, CPTO); Montreal, Sainte-Anne-de-Bellevue, 5.vii.2012 (13:00), swept from forbs, P. de Tonnancour (1, CPTO).

Tribe Tropiderini Lacordaire, 1865

***Gonotropis dorsalis* (Thunberg, 1796), new to New Brunswick**

Note. This transcontinental Canadian species has previously been placed in the genus *Tropideres* Schönherr.

Specimen data. New Brunswick: York County, Charters Settlement, 45.8395°N, 66.7391°W, 20.v.2012, R Webster, on window screen (1, RWC). Fredericton, Odell Park, 45.9571°N, 66.6650°W, 10–26.vii.2012, C. Alderson & V. Webster, old-growth eastern hemlock forest, Lindgren trap in *Tsuga canadensis* canopy (2, RWC).

Tribe Zygaenodini Lacordaire, 1865

***Eusphyrus walshii* LeConte, 1876, new data supporting first records for Quebec**

Note. This species was recorded "from Quebec to Florida, west to Michigan and eastern Texas" by Valentine (1999, not McNamara 1991) without specific details about its distribution within Quebec. We provide data on the occurence of this species in Quebec for the first time.

Specimen data. Quebec: MRC Les Collines-de-l'Outaouais Luskville, Chemin Pilon, 24.vi.2001, C. Chantal (1, CCCH); MRC Marguerite-D'Youville, Varennes (Verchères), 9.ix.2002, C. Chantal (1, CCCH); Longueuil, St-Bruno-de-Montarville, 45.588°N, 73.303°W, 22–29.vii.2008, Projet Défense Nationale, Site 1 Parcelle 4, érablière à caryer, Sante trap, Propylene 100%, 2008-3-1437 (1, CNCI); MRC Vaudreuil-Soulanges, Rigaud, 1.vii.1993 (15 :00), beaten from dead branch of *Carya ovata*, P. de Tonnancour (1, CPTO); Montreal, Ste-Anne-de-Bellevue, 5.vii.2012 (15:00) on *Ulmus americana*, P. de Tonnancour (1, CPTO); MRC Marguerite-D'Youville, Contrecoeur, 7.vii.2012, dead branch of *Salix* sp., P. de Tonnancour (1, CPTO).

Subfamily Choraginae Kirby, 1819
Tribe Araecerini Lacordaire, 1865

***Euxenus punctatus* LeConte, 1876, new to New Brunswick**

Note. This species was previously known in Canada only from Quebec (McNamara 1991). It is the smallest anthribid in Canada.

Specimen data. New Brunswick: Queens County, Jemseg, 45.8412°N, 66.1195°W, 28.vi–10.vii.2012, Lindgren trap under *Quercus macrocarpa*, C. Hughes & R. Webster (1, RWC).

2) Family Brentidae Billberg, 1820
Subfamily Apioninae Schönherr, 1823
Tribe Apionini Schönherr, 1823

***Loborhynchapion cyanitinctum* (Fall, 1927), new to New Brunswick, Northwest Territories**

Note. This widespread and northern species is recorded from the maritime provinces for the first time. It has been collected on *Astragalus* (Bright 1993).

Specimen data. New Brunswick: Carleton County, Meduxnekeag Valley Nature Preserve, 46.1891°N, 67.6762°W, 11.vi.2012, swept from foliage by river, R.P. Webster (1, RWC). **Northwest Territories:** Anderson River Delta, Fox Den II, 29.vi–15.vii.1977, D. Shpeley & G.E. Ball (1, CMNC).

Ischnopterapion (*Ischnopterapion*) *loti* (Kirby, 1808), new to Canada

Note. This adventive species is broadly distributed in the Palaearctic Region (Alonso-Zarazaga 2011). In Canada it feeds on the introduced weed *Lotus corniculatus* L. (Fabaceae) which is common in eastern Canada and British Columbia (Turkington and Franko 1980). This species may be more widespread in Canada than presently documented because extensive surveys have not been conducted.

Specimen data. Quebec: MRC Vaudreuil-Soulanges, Ville de l'Île-Perrot, 17.v.2011, swept from *Lotus corniculatus*, P. de Tonnancour (2, CNCI; 17, CPTO); MRC Vaudreuil-Soulanges, Ville de l'Île-Perrot, 18.v.2011, swept from *Hesperis matronalis*, P. de Tonnancour (5, CPTO).

Stenopterapion meliloti (Kirby, 1808), new to Canada

Note. This adventive species is broadly distributed in the Palaearctic Region (Alonso-Zarazaga 2011). In Canada it feeds on the introduced weed *Melilotus alba* Desr. which is common across Canada (Turkington et al. 1978). This species may be more widespread in Canada than presently documented because extensive surveys have not been conducted.

Specimen data. Quebec: MRC La Vallée-du-Richelieu, Mont-Saint-Hilaire, 7.vi., 23.vi.2004, 18.viii.2007, H. Miquet-Sage (3, CHMS); MRC Vaudreuil-Soulanges, Notre-Dame-de-l'Île-Perrot, 2.iv.2007, 12.v.2011 (13:00), 17.v.2011, 10.vi.2011, 14.ix.2011, 19.iv.2012 (13:00), under bark of *Pinus strobus*, swept from *Melilotus alba*, P. de Tonnancour (2, CNCI; 29, CPTO).

Trichapion nigrum (Herbst, 1797), new to Ontario and Quebec

Note. This native species was newly recorded in Canada in New Brunswick by Majka et al. (2007a) and feeds on the seeds of *Robinia pseudoacacia* L. (Fabaceae). That the first specimen was collected over 50 years ago, that the host is widespread, and that this tribe has received little taxonomic attention, all suggest that this species may be more widespread than known.

Specimen data. Ontario: Simcoe Co., Cookstown, Lake Simcoe, 11.vi.1962, S62-1237-01, *Robinia pseudoacacia*, F. I. S. (1, CNCI); **Quebec:** MRC Vaudreuil-Soulanges, Ville de l'Île-Perrot, 21.vi.2011 (14:00) beaten from *Robinia pseudoacacia*, P. de Tonnancour (2, CNCI; 1, CPTO); MRC Vaudreuil-Soulanges, Ville de l'Île-Perrot, 1.vii.2011 (18:00) beaten from *Robinia pseudoacacia*, P. de Tonnancour (14, CNCI).

Trichapion porcatum (Boheman, 1839), new to Quebec

Note. This native species was recorded from Ontario by McNamara (1991) and from New Brunswick by Webster et al. (2012).

Specimen data. Quebec: Gatineau, Queens Park, 9.vii.2011 (19:00) beaten from *Desmodium canadense*, P. de Tonnancour (2, CNCI; 1, CPTO); MRC Vaudreuil-Soulanges, Ville de l'Île-Perrot, 21.vi.2011 (14:00) beaten from *Robinia pseudoacacia*, P. de Tonnancour (1, CPTO).

Subfamily Nanophyinae Gistel, 1848
Tribe Nanophyini Gistel, 1848

***Nanophyes marmoratus marmoratus* (Goeze, 1777), new to Ontario and Quebec**

Note. This species was introduced to New York State for the biological control of purple loosestrife, *Lythrum salicaria* L. (Lythraceae) (Anderson 2003). It is likely that the new Ontario and Quebec records represent natural dispersal from the adjacent northern USA.

Specimen data. Ontario: Lanark Co., Packenham, 10.ix.2012, on *Lythrum salicaria*, E. St-Louis (1, CNCI); **Quebec:** MRC Vaudreuil-Soulanges, Saint-Lazare, 3.vi.2011, 1.ix.2011, swept or beaten from *Lythrum salicaria*, P. de Tonnancour (2, CPTO); MRC Vaudreuil-Soulanges, Notre-Dame-de-l'Île-Perrot, 19.v., 22.v., 30.v., 31.v.2011, 2.vi.2011, 2.vii.2011 (15:00), 29.viii.2011, 2.ix.2011, 1.vi.2012, all beaten or swept from *Lythrum salicaria*, P. de Tonnancour (18, CPTO; 23 CNCI); MRC Vaudreuil-Soulanges, Mt. Rigaud, 19.iv.2012, beaten from *Salix* sp., P. de Tonnancour (1, CPTO); MRC Les Collines-de-l'Outaouais, Bristol, Knox Landing Road, sand pit, 26.v.2012, on *Lythrum salicaria*, S. Laplante (2, CNCI).

3) Family Dryophthoridae Schönherr, 1825
Subfamily Rhynchophorinae Schönherr, 1833
Tribe Sphenophorini Lacordaire, 1865

***Sphenophorus incongruus* Chittenden, 1905, new to Quebec**

Note. This native species was recorded from Ontario by McNamara (1991), and is associated with great rush, *Schoenoplectus tabernaemontani* (C.C.Gmel.) Palla, in wetlands (Vaurie 1951).

Specimen data. Quebec: MRC Deux-Montagnes, Oka, Parc national d'Oka, 7.iv.1991, under stone, lakeside, P. de Tonnancour (1, CPTO); MRC Deux-Montagnes, Oka, Parc Paul-Sauvé, 9.v.1993, 13.v.1994, P. Vigneault (2, CRVI).

4) Family Brachyceridae Billberg, 1820
Subfamily Erirhininae Schönherr, 1825
Tribe Stenopelmini LeConte, 1876

***Lissorhoptrus oryzophilus* Kuschel, 1952, new to Quebec**

Note. This native species was previously known from Alberta (McNamara 1991). A pest of cultivated rice (where grown); larvae feed externally on roots (Anderson 2002). It is likely that related native semiaquatic grasses are the hosts elsewhere in North America.

Specimen data. Quebec: MRC Marguerite-D'Youville, Varennes (Verchères), 25.vi.2007, C. Chantal (1, CCCH).

5) Family Curculionidae Latreille, 1802
Subfamily Curculioninae Latreille, 1802
Tribe Anthonomini Thomson, 1859

***Anthonomus rufipes* LeConte, 1876, new to Quebec**

Note. This native species was recorded from Alberta by McNamara (1991). Based on label data for specimens reported here, the species appears to be associated with *Aster* and *Symphyotrichum* spp. (Asteraceae).

Specimen data. Quebec: RCM Rouville, Rougemont, 4.vi.1966, C. Chantal (2, CCCH); MRC La Vallée-du-Richelieu, Saint-Lambert, 8.viii.1966, 16.vii.1967, P. de Tonnancour (3, CPTO); MRC L'Islet, Lac des Trois-Saumons, 1.vii.1968, C. Chantal (1, CCCH); Montreal, Dollard-des-Ormeaux, 25.viii.1974, C. Chantal (7, CCCH); MRC Vaudreuil-Soulanges, Terrasse-Vaudreuil, 17.vi.1993 (18:00), apical bud of *Symphyotrichum novae-angliae*, P. de Tonnancour (7, CPTO); MRC La Vallée-du-Richelieu, Mont-Saint-Hilaire, 9.vi.2004, H. Miquet-Sage (1, CHMS); MRC Vaudreuil-Soulanges, Notre-Dame-de-l'Île-Perrot, 31.v.2011, 1.vi., 2.vi., 17.vi.2011 (13:00, 14:00, 15:00), swept from *Solidago/Aster*, P. de Tonnancour (12, CPTO); MRC Vaudreuil-Soulanges, Ville de l'Île-Perrot, 4 June 2011 (11:00), swept from *Symphyotrichum novae-angliae*, P. de Tonnancour (3, CPTO); MRC Vaudreuil-Soulanges, Notre-Dame-de-l'Île-Perrot, 17.vi.2011 (13:00), swept from *Aster* sp., P. de Tonnancour (1, CPTO); MRC Vaudreuil-Soulanges, Ville de l'Île-Perrot, 13 August 2011 (13:00), swept from *Aster* sp., P. de Tonnancour (2, CPTO); MRC Vaudreuil-Soulanges, Notre-Dame-de-l'Île-Perrot, 1.vi.2012 (13:00), swept from *Trifolium pratense*, P. de Tonnancour (1, CPTO); MRC Vaudreuil-Soulanges, Saint-Lazare, 31.viii.2012, swept from *Symphyotrichum novae-angliae*, P. de Tonnancour (1, CPTO).

Anthonomus suturalis LeConte, 1824, new to Quebec

Note. This species was recorded from British Columbia and Ontario by McNamara (1991). The species is associated with *Phyloxera* galls on leaves of *Carya* spp. (Juglandaceae) (Ahmad and Burke 1972).

Specimen data. Quebec: MRC Vaudreuil-Soulanges, Rigaud, 17.vii.1979, S. Laplante (1, CSLA); MRC Deux-Montagnes, Oka, Deux-Montagnes, beaten from *Carya ovata*, 13.vii., 15.vii.1982, 21.v.1983, C. Chantal (9, CCCH); Montreal, Dollard-des-Ormeaux, 16.vii.1982, C. Chantal (1, CCCH); Montreal, Sainte-Anne-de-Bellevue, 12.vi.1984, M.C. Larivière (3, LEMQ); Laval, Ste. Dorothée, 10.v.1987, F. Genier (1, CMNC); MRC Vaudreuil-Soulanges, Rigaud, 16.vi.1990, on *Carya ovata*, S. Laplante (1, CSLA); MRC Vaudreuil-Soulanges, Rigaud, 8.vii.1990 (15:00), beaten from *Carya ovata*, P. de Tonnancour (5, CPTO); Montreal, Sainte-Anne-de-Bellevue, 13.v.1992, S. Côté (1, CMNC); MRC Deux-Montagnes, Oka, 14.v.1993, 10.vii.1996, R. Vigneault (6, CRVI); MRC Deux-Montagnes, Oka, Parc d'Oka, Calvaire d'Oka, 5.vi.2004, R. Vigneault (1, CRVI); MRC Vaudreuil-Soulanges, Notre-Dame-de-l'Île-Perrot, 12.v.2011 (14:00), beaten from *Rubus* sp., P. de Tonnancour (1, CPTO); MRC Vaudreuil-Soulanges, Terrasse-Vaudreuil, 19.v.2011, 21.v.2011 (14:00, 23:00), beaten from *Prunus nigra*, white and UV light, P. de Tonnancour (2, CPTO).

Anthonomus tectus LeConte, 1876, new to Alberta

Note. This species is known in Canada only from the prairie provinces of Manitoba and Saskatchewan; we here add Alberta and document an association with *Heterotheca villosa* (Pursh.) Shinners (Asteraceae).

Specimen data. Alberta: 6.5 km E. Clyde, 15.vii.1989, swept from *Heterotheca villosa* (Pursh.) Shinners, R.S. Anderson (5, CMNC).

Pseudanthonomus seriesetosus Dietz, 1891, new to New Brunswick

Note. This eastern North American species is now recorded from New Brunswick. Adults have been associated with *Vaccinium* sp. (Ericaceae) (Clark 1987).

Specimen data. New Brunswick: Restigouche County, Dionne Brook P.N.A., 47.9030°N, 68.3503°W, 30.v–15.vi.2011, Lindgren funnel trap, M. Roy & V. Webster (1, CMNC; 1, RWC).

Tribe Cionini Schönherr, 1825

***Cionus scrophulariae* (Linnaeus, 1758), new to Canada**

Note. This adventive Palaearctic species, which is associated with *Scrophularia* and *Verbascum* (Scrophulariaceae), is known to be established in New York (Anderson 2002).

Specimen data. Quebec: Montreal, 19.vi.2009, on *Verbascum thapsus*, CERL 15531, R. Limoges (1, CRLI).

Tribe Curculionini Latreille, 1802

***Curculio pardalis* (Chittenden, 1908), new to Quebec**

Note. This native species was recorded in Canada from Manitoba and Ontario by McNamara (1991). It is is associated with *Quercus* spp. (Fagaceae) throughout its range (Gibson 1969).

Specimen data. Quebec: MRC Deux-Montagnes, Oka, Parc d'Oka, 6.vi.1995, R. Vigneault (1, CRVI); Parc Gatineau, Mont King, 2.vii.1995, R. Vigneault (2, CRVI); MRC Les Collines-de-l'Outaouais, Luskville, 18.vii.1996, R. Vigneault (1, CRVI); MRC Deux-Montagnes, Oka, 11.vi.1997, R. Vigneault (2, CRVI); MRC Vaudreuil-Soulanges, Rigaud, 12.vii.1997, UV Light, R. Vigneault (1, CRVI); MRC Les Collines-de-l'Outaouais, Eardley, 19.vii.1997, R. Vigneault (1, CRVI).

***Curculio sulcatulus* (Casey, 1897), new to New Brunswick**

Note. This eastern North American species is associated with *Quercus* spp. throughout its range (Gibson 1969).

Specimen data. New Brunswick: Queens County, Jemseg, 45.8412°N, 66.1195°W, 21.viii.-7.ix.2012, Lindgren trap in *Quercus rubra* canopy, C. Hughes & K. Van Rooyen (1, RWC); Sunbury County, Sunpoke Lake, 45.7656°N, 66.5550°W, 15–27.viii.2012, Lindgren trap under *Quercus rubra*, C. Alderson & V. Webster (1, RWC).

Tribe Mecinini Gistel, 1848

***Mecinus janthinus* (Germar, 1821), new to Quebec**

Note. This adventive Palaearctic stem-mining weevil was introduced for the biological control of toadflaxes, *Linaria* spp. (Scrophulariaceae), and was known from Alberta, British Columbia, and Nova Scotia (Majka et al. 2007b, De Clerck-Floate and Cárcamo 2011).

Specimen data. Quebec: MRC Marguerite-D'Youville, Varennes (Verchères), 30.vii.2011, 9.v., 12.v., 14.v., 24.v.2012, 1.vi.2012, C. Chantal (11, CCCH); MRC Pierre-De Saurel, Sorel-Tracy, 14.v.2012, C. Chantal (1, CCCH).

Rhinusa neta (Germar, 1821), new to Quebec

Note. This adventive Palaearctic species was introduced into British Columbia for control of toadflaxes, *Linaria* spp., (De Clerck-Floate and Cárcamo 2011).

Specimen data. Quebec: MRC Deux-Montagnes, Oka, Parc d'Oka, Calvaire d'Oka, 5.v.2000, R. Vigneault (1, CRVI).

Tribe Rhamphini Rafinesque, 1815

Orchestes alni (Linnaeus, 1758), new to Ontario and Quebec

Note. In Canada this species was previously only known from British Columbia. Adults and larvae of this adventive species are associated with *Ulmus americana* L. (Ulmaceae) (Anderson *et al.* 2007).

Specimen data. Ontario: Toronto, Yonge Street and York Mills Road, 30.v.2008, on *Ulmus* leaves, C. Grant (CFIA) (6, CNCI); Essex Co., Leamington, 17.v.2011, in greenhouse, Dean coll. (1, CNCI); Essex Co., Windsor, Malden Park, 17.iv.2012, Forestry Trapping, CFIA (1, CNCI); **Quebec:** MRC Le Haut-Saint-François, Scotstown, 16.vii.2007, C. Levesque (1, CNCI); Longueuil, 18.vi.2011 (18:00), swept from *Ambrosia artemisiifolia*, P. de Tonnancour (1, CPTO); Montreal, Sainte-Anne-de-Bellevue, 2.vii.2011 (13:00) beaten from *Ulmus americana*, P. de Tonnancour (10, CNCI; 14, CPTO); Montreal, Sainte-Anne-de-Bellevue, 16.vii.2011 (16:00), 24.viii.2011 (13:00), 31.viii.2011 (13:00), 12.ix.2011 (12:00), beaten from *Ulmus americana* (5) or *U. parvifolia* (4), P. de Tonnancour (16, CPTO).

Tribe Smicronychini Seidlitz, 1891

Promecotarsus densus Casey, 1892, new to Alberta

Note. This western North American prairie species is now recorded from Alberta. Nothing is known of the biology of this species.

Specimen data. Alberta: Division #1, Onefour, 2.viii.1980, sweeping, G.A.P. Gibson (2, CMNC); Division #1, Cypress Hills Interprovincial Park, 14.viii.1980, sweeping, G.A.P. Gibson (1, CMNC); Division #1, C.F.B. Suffield, 50.628°N, 110.306°W, 28.vii.1994, A.T. Finnamore (6, CMNC).

***Smicronyx griseus* LeConte, 1876, new to Canada**

Note. This native species is distributed in the northeastern United States. Host plants are not known.

Specimen data. Ontario: Essex County, Windsor, Ojibway Prairie, 3–7.viii.2001, 12–13.ix.2002, M. Buck & S. Paiero (2, CMNC).

***Smicronyx lineolatus* Casey, 1892, new to Canada**

Note. This native species is distributed in the northeastern United States. Host plants are not known.

Specimen data. Manitoba: Junction Highways 21 and 38 N, 49.5626°N, 100.5299°W, 7.vii.2007, tallgrass prairie, sweeping, R. Webster (2, RWC); **Ontario:** Haldimand-Norfolk Region, Delhi-Simcoe Railway Site, 11–14.vii.2001, yellow pans, S. Paiero (1, CMNC).

Tribe Tychiini Gistel, 1848

***Lignyodes bischoffi* (Blatchley, 1916), new to New Brunswick**

Note. This native eastern North American species is associated with *Fraxinus* (Clark 1980).

Specimen data. New Brunswick: Sunbury County, Gilbert Island, 45.8770°N, 66.2954°W, 25.vii–8.viii.2012, 8–21.viii.2012, Lindgren trap in *Tilia americana* canopy, C. Alderson, C. Hughes, & V. Webster (3, RWC); Queens County, Jemseg, 45.8412°N, 66.1195°W, 8–21.viii.2012, Lindgren funnel trap, C. Alderson , C. Hughes, & V. Webster (1, CNMC).

***Lignyodes horridulus* (Casey, 1892), new to New Brunswick**

Note. This native central/eastern North American species is associated with *Fraxinus* (Clark 1980).

Specimen data. New Brunswick: York County, New Maryland, Charters Settlement, 45.8395°N, 66.7391°W, 18.vi.2005, UV light, R.P. Webster (1, RWC); Sunbury County, Gilbert Island, 45.8770°N, 66.2954°W, 28.v-12.vi.2012, Lindgren funnel trap, C. Alderson, C. Hughes, & V. Webster (1, CNMC).

***Tychius liljebladi* Blatchley, 1916, new to Quebec**

Note. This widespread western and central native North American species is associated with *Astragalus* spp. (Fabaceae); larvae are in reproductive structures (Anderson 2002).

In Canada the species was known from Alberta, Manitoba and Saskatchewan (McNamara 1991); these Quebec records are a significant eastward range extension.

Specimen data. Quebec: Gatineau, Aylmer, 18.vii.2004, 22.vii.2004, 28.vi.2005, 8.vii.2005, 9.vii.2011, on flowers of *Astragalus canadensis*, S. Laplante (25, CSLA, 10, CNCI, 2 CMNC); Gatineau, Aylmer, 28.vi.2005, F. Génier (8, CMNC); Gatineau, Aylmer, Queen's Park, 9.vii.2011, beaten from *Astragalus canadensis*, P. de Tonnancour (26, CPTO).

Subfamily Bagoinae C.G. Thomson, 1859

Pnigodes setosus LeConte, 1876, new to Canada

Note. This rarely collected native species has been recorded from the central United States north to Montana and South Dakota (O'Brien & Wibmer 1982). It is associated with semi-aquatic habitats or wetlands.

Specimen data. Alberta: C.F.B. Suffield, 50.451°N, 110.762°W, 29.vi.1994, pan traps, A.T. Finnamore (3, CMNC).

Subfamily Baridinae Schönherr, 1836
Tribe Apostasimerini Schönherr, 1844

Barinus cribricollis (LeConte, 1876), new to Canada

Note. This widespread native central USA species is recorded from Canada for the first time. *Barinus* species are associated with sedges in wetlands (Anderson 2002).

Specimen data. Quebec: RCM Pierre-De Saurel, Saint-Roch-de-Richelieu, 1.vi.2000, H. Miquet-Sage (3, CHMS); MRC Deux-Montagnes, Oka, Parc d'Oka, 28.v.2002, R. Vigneault (1, CMNC; 1, CRVI); MRC Marguerite-D'Youville, Varennes, 7.vi.2003, C. Chantal (1, CMNC); MRC Vaudreuil-Soulanges, Notre-Dame-de-l'Île-Perrot, 5.vi.2012, swept from *Equisetum*, *Carex* and grasses, P. de Tonnancour (1, CPTO); MRC Marguerite-D'Youville, Verchères, Contrecoeur, 7.vii.2012, swept from *Carex*, sandy bank of Saint-Lawrence River, H. Miquet-Sage (1, CPTO).

Sibariops confinis (LeConte, 1876), new to Canada

Note. This native eastern USA species is recorded from Canada for the first time. *Sibariops* species are associated with sedges in wetlands (Anderson 2002).

Specimen data. Quebec: Gatineau, Aylmer, 25.v.2012, swept from Cyperaceae, P. de Tonnancour (3, CPTO).

***Sibariops confusus* (Boheman, 1836), new to Canada**

Note. This widespread native eastern and central USA species is recorded from Canada for the first time. *Sibariops* species are associated with sedges in wetlands (Anderson 2002).

Specimen data. Quebec: MRC Le Haut-Richelieu, Saint-Blaise-sur-Richelieu, 19.iv.1980, C. Chantal (1, LEMQ); MRC La Vallée-du-Richelieu, Mont-Saint-Hilaire, 19.v.2004, H. Miquet-Sage (1, CHMS); MRC Vaudreuil-Soulanges, Notre-Dame-de-l'Île-Perrot, 5.vi.2012, swept from *Scirpus* and *Eleocharis*, P. de Tonnancour (1, CPTO).

Tribe Baridini Schönherr, 1836

***Cosmobaris scolopacea* Germar, 1819, new to Manitoba**

Note. This adventive species is widespread in Canada. It is associated with various Chenopodiaceae (Ciegler 2010).

Specimen data. Manitoba: ca. 5 km E. Junction Highways 21 & 345, 49.3849°N, 100.4378°W, 7.vii.2007, sweeping, R.P. Webster (4, RWC).

***Trichobaris trinotata* (Say, 1832), new to Quebec**

Note. This native species, the potato stalk borer, was previously known in Canada only from Ontario. This species is a pest of various Solanaceae; larvae feed in stems (Anderson 2002).

Specimen data. Quebec: MRC Deux-Montagnes, Oka, Parc d'Oka, 20.vi.2000 (1, CRVI).

Tribe Madarini Jekel, 1865

***Ampeloglypter ampelopsis* (Riley, 1869), new to Quebec**

Note. This native species was previously known in Canada only from Ontario. This species is a pest of *Vitis* (grape; Vitaceae); larvae make galls on stems (Anderson 2002), often breaking the vine.

Specimen data. Quebec: MRC Vaudreuil-Soulanges, Terrasse-Vaudreuil, 19.v.2011, beaten from *Prunus nigra*, P. de Tonnancour (1, CPTO); MRC Vaudreuil-Soulanges, Notre-Dame-de-l'Île-Perrot, 20 May 2011 (17:00), beaten from *Spiraea x vanhouttei* & *Rubus odoratus*, P. de Tonnancour (2, CPTO); Montreal, Ste-Anne-de-Bellevue, 28.vi.2011, beaten from leaves of *Juglans nigra*, P. de Tonnancour (1, CPTO).

Desmoglyptus crenatus (LeConte, 1876), new to Canada

Note. This rare, native species is known from the northeastern USA: District of Columbia, Maryland, Pennsylvania, and Virginia, and occurs on wild grape, *Vitis* sp. (Vitaceae) (Blatchley and Leng 1916).

Specimen data. Ontario: Essex County, Point Pelee National Park, 11–17 Jul 2003, yellow pan traps in *Opuntia* sp. field , D. Cheung, (1, CMNC), debu00219744.

Subfamily Ceutorhynchinae Gistel, 1848
Tribe Ceutorhynchini Gistel, 1848

Ceutorhynchus hamiltoni Dietz, 1896, new to Quebec

Note. This native species is widespread along the eastern coastal USA and maritime provinces of Canada (Majka et al. 2007b) on American searocket, *Cakile edentula* Bigelow (Hook.) (Brassicaceae).

Specimen data. Quebec: RCM La Haute-Gaspésie, Cap Chat, 21.vii.1954, on *Cakile edentula*, J.E.H. Martin (2, CMNC; 47, CNCI); RCM Bonaventure, New Richmond, 6.viii.1954, on *Cakile edentula*, J.E.H. Martin (5, CNCI).

Microplontus campestris (Gyllenhal, 1837), new to Quebec

Note. This adventive Palaearctic species is associated with *Leucanthemum vulgare* (L.) (Asteraceae) and may help control this invasive weed. This weevil was accidentally introduced into North America, and has been present in Ontario since 1971, or earlier (Anderson and Korotyaev 2004).

Specimen data. Quebec: MRC Marguerite-D'Youville, Varennes (Verchères), 30.vi.2008, C. Chantal (1, CCCH).

Tribe Cnemogonini Colonnelli, 1979

Dietzella zimmermanni (Gyllenhal, 1837), new to New Brunswick

Note. This transcontinental native species is recorded from New Brunswick for the first time. It is associated with *Epilobium* (Ciegler 2010).

Specimen data. New Brunswick: Restigouche County, Jacquet River Gorge P.N.A., 47.7491°N, 66.1114°W, 24.vi.2008, R.P. Webster, swept from foliage (1, RWC).

Tribe Phytobiini Gistel, 1848

***Parenthis vestitus* Dietz, 1896, new to New Brunswick**

Note. This native eastern North American species was previously known in Canada only from Ontario. It is associated with wetlands.

Specimen data. New Brunswick: Queens Co., Jemseg, 45.8412°N, 66.1195°W, 25.vii-8.viii.2012, C. Alderson , C. Hughes, & V. Webster, Lindgren trap (1, RWC); Sunbury County, Gilbert Island, 45.8770°N, 66.2954°W, 18–28.V.2012, 25.V–12.vi.2012, 11–25.vii.2012, Lindgren trap under *Juglans cinerea*, C. Alderson, C. Hughes & V. Webster (1, CMNC; 5, RWC); Sunbury County, Gilbert Island, 45.8770°N, 66.2954°W, 21.viii-7.ix.2012, C. Hughes & K. Van Rooyen (1, CMNC).

***Pelenomus squamosus* LeConte, 1876, new to New Brunswick**

Note. This transcontinental North American species is recorded from the Maritime Provinces for the first time. It is associated with wetlands.

Specimen data. New Brunswick: Queens County, Jemseg, 45.8412°N, 66.1195°W, 14–28.v.2012, Lindgren funnel, C. Alderson, C. Hughes, & V. Webster (1, RWC); Restigouche County, Wild Goose Lake, 420 m elev., 47.8540°N, 66.3219°W, 7.vi.2012, treading *Carex* & grasses, R. Webster & M. Turgeon (1, RWC); Sunbury County, Gilbert Island, 45.8770°N, 66.2954°W, 11–25.vii.2012, Lindgren trap, C. Alderson, C. Hughes & V. Webster (1, CMNC).

Tribe Scleropterini Schultze, 1902

***Asperosoma echinatum* (Fall, 1917), new to Ontario**

Note. This species (Fig. 1) is associated with the native grassland forb *Heuchera richardsoni* R. Br. (Saxifragiaceae) (Fall 1917) and was previously known only from Manitoba (McNamara 1991). This species is at present a Canadian endemic, although it may also exist in USA. Targeted collecting efforts at other Ontario sites have not yielded additional specimens.

Specimen data. Ontario: Essex Co., Windsor, Burnt Prairie, v.2001, S. Paiero, CNC COLEOPT #04-5422 (1, CMNC).

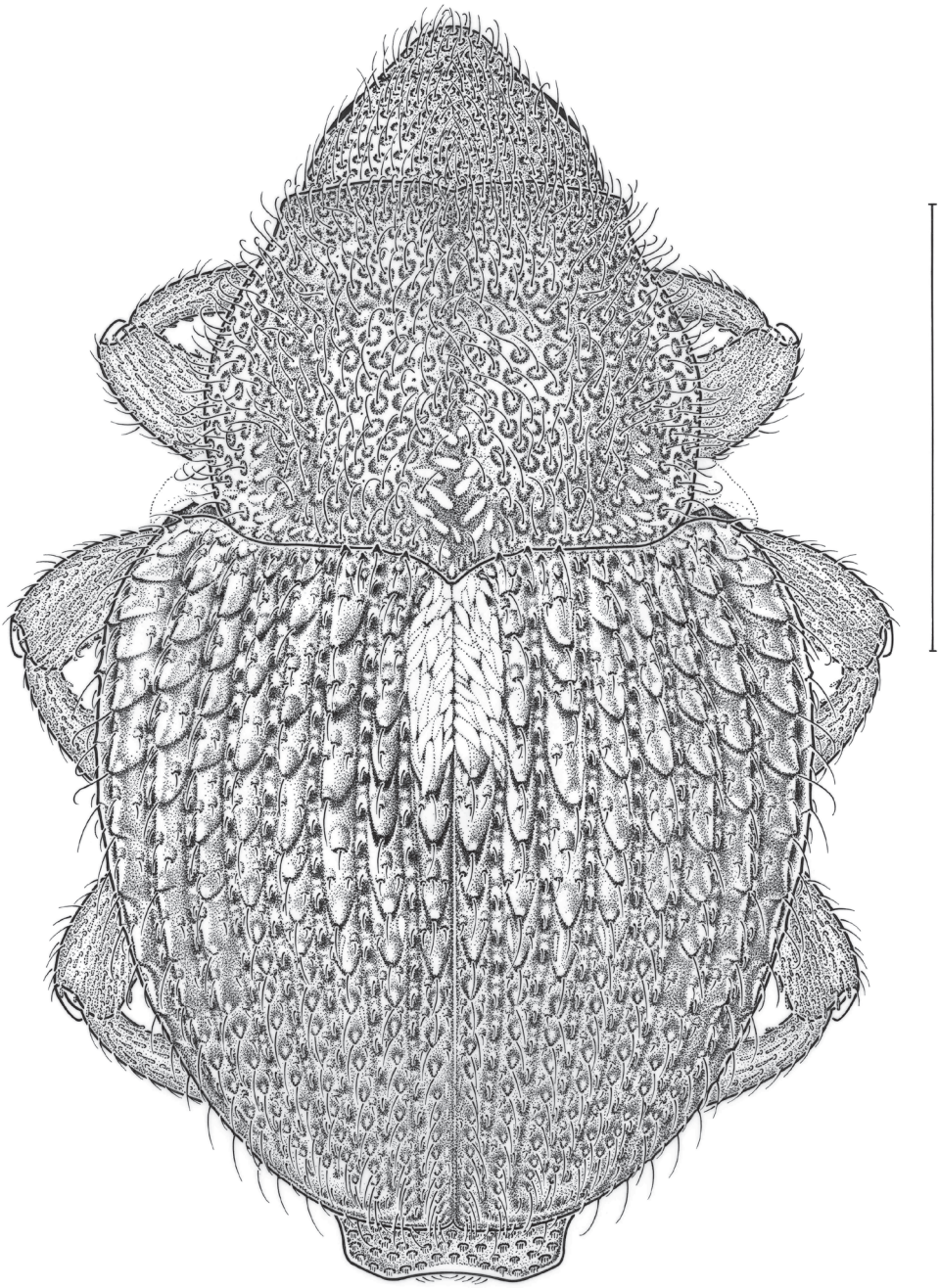

Figure 1. Dorsal habitus drawing of *Asperosoma echinatum* (Fall, 1917), a species to-date only known from Canada. Scale line = 1mm.

Subfamily Conoderinae Schönherr, 1833
Tribe Lechriopini Lacordaire, 1865

***Psomus armatus* Dietz, 1891, new to New Brunswick**

Note. This native eastern North American species is recorded from the Maritime Provinces for the first time. It is associated with forest habitats, and has been recorded on sprouts of white ash, *Fraxinus americanus* L. (Blatchley & Leng 1916).

Specimen data. New Brunswick: Carleton County, Jackson Falls, Bell Forest, 46.2200°N, -67.7231°W, 3–17.vii.2012, Lindgren trap in *Tilia americana* canopy, C. Alderson & V. Webster (1, RWC); Queens County, Jemseg, 45.8412°N, 66.1195°W, 28.vi–10.vii.2012, Lindgren funnel trap, C. Alderson &V. Webster (1, RWC).

Tribe Zygopini Lacordaire, 1865

***Cylindrocopturus furnissi* Buchanan, 1940, new to Canada**

Note. This native species, known in USA as the Douglas-fir twig weevil, was recorded from California, Oregon and Washington by O'Brien and Wibmer (1982). It is a minor pest of shoots of weakened *Pseudotsuga* spp. (Pinaceae).

Specimen data. British Columbia: Kootenays Region, Wynndel (2 mi. N.), 28.vi.–3.vii.1980, R. Anderson (1, CMNC).

***Cylindrocopturus quercus* (Say, 1832), new to Canada**

Note. This native species was recorded from eastern USA by O'Brien and Wibmer (1982). Adults of this species breed in ragweed, *Ambrosia artemesiifolia* L. (Piper 1977).

Specimen data. Quebec: Montreal, (1, CNCI); Ormstown, 29.vi.1978, E.J. Kiteley (1, CNCI); MRC Vaudreuil-Soulanges, Notre-Dame-de-l'Île-Perrot, 19.vi.2011 (17:00), 12.viii.2012 (17:00), swept from *Erigeron* sp., beaten from *Asclepias syriaca*, P. de Tonnancour (3, CPTO).

Subfamily Cossoninae Schönherr, 1825
Tribe Dryotribini LeConte, 1876

***Caulophilus dubius* (Horn, 1873), new to Canada**

Note. This native species was recorded from eastern USA north to Illinois, Michigan, New York, Ohio and Pennsylvania by O'Brien and Wibmer (1982). Adults are found beneath the dead tree bark (Blatchley and Leng 1916).

Specimen data. Quebec: Montreal, Sainte-Anne-de-Bellevue, Morgan Arboretum, yellow pan traps, 25–29.vi.2001, J. Forrest (1, LEMQ).

Tribe Onycholipini Wollaston, 1873

Pseudopentarthrum parvicollis (Casey, 1892), new to Canada

Note. This native species is widespread in the eastern USA from TX north to NY. It is associated with decaying wood, particularly old tree holes.

Specimen data. Ontario: Kent County, Rondeau Provincial Park, Spicebush Trail, 42°18'09"N, 81°51'06"W, 16–29 Jul 2003, S.A. Marshall, Malaise Trap in Carolinian forest (1; CMNC), debu01123692.

Tribe Rhyncolini Gistel, 1848

Rhyncolus knowltoni (Thatcher, 1940), new to Alberta, and Saskatchewan

Note. This native western North American species was previously only known in Canada from Manitoba. It has been associated with *Populus tremuloides* Michx.

Specimen data. Alberta: Southern Alberta, Medicine Hat, viii.1980, pan trap, G.A.P. Gibson, (1; CMNC); Division #2, 0.5 km E. Writing-on-Stone Provincial Park, 6–15.vi.1981, pan traps, D. McCorquodale (1; CMNC); Division #1, Cypress Hills Interprovincial Park, 4 km S. Elkwater, 22.vi-19.viii.1988, 1400m, S. & J. Peck, fir-pine-aspen forest, FIT (1; CMNC); **Saskatchewan:** Maple Creek No. 111, Cypress Hills Interprovincial Park, Center Block, Boiler Creek aspen forest, 21.vi-19.viii.1988, FIT 1200m, S. & J. Peck (1; CMNC).

Rhyncolus macrops Buchanan, 1946, new to New Brunswick

Note. This transcontinental native North American species is recorded from New Brunswick for the first time. Adults are associated with a variety of dead coniferous trees (Pinales) (Buchanan 1946).

Specimen data. New Brunswick: Carleton County, Jackson Falls, Bell Forest, 46.2200°N, 67.7231°W, 7.vi.2007, 27.vi.2008 under spruce bark & in Lindgren trap, R. Webster (2, RWC); Sunbury County, Acadia Research Forest, 45.9866°N, 66.3841°W, 19–25.v.2009, 25.v–2.vi.2009, 16–24.vi.2009, red spruce forest, Lindgren traps, R. Webster & M.A. Giguère (3, RWC); York County, Charters Settlement, 45.8380°N, 66.7300°W, 6.v.2004, under bark, R. Webster (1, RWC).

Subfamily Cryptorhynchinae Schönherr, 1825
Tribe Cryptorhynchini Schönherr, 1825

***Acalles carinatus* LeConte, 1876, new to Quebec**

Note. Label data from many specimens from throughout its range in eastern USA and southern Ontario indicates that this native species occurs commonly in hardwood forest leaf litter.

Specimen data. Quebec: MRC Deux-Montagnes, Oka, Parc d'Oka, 11.vi.1995, R. Vigneault (1, CRVI); MRC La Vallée-du-Richelieu, Mont-Saint-Hilaire, yellow pan traps, 11–18.vi.2001, E. Fast (1, CMNC); MRC La Vallée-du-Richelieu, Mont-Saint-Hilaire, beach-sugar maple forest, yellow pan traps, 21–28.v.2001, E. Fast (1, LEMQ); same except: 16–23.vii.2001 (1, LEMQ); Montreal, Sainte-Anne-de-Bellevue, Morgan Arboretum, 10–15.vi., 15–20.vi., 20–25.vi., 3–9.vii., 20–26.viii.2001, J. Forrest, yellow pan traps in ash-sugar maple forest (6, LEMQ).

***Cryptorhynchus tristis* LeConte, 1876, new to Canada**

Note. This widespread native eastern USA species is said to feed on leaves of *Quercus coccinea* Wang. (Fagaceae, scarlet oak) at night and larvae develop under the bark (Anderson 2008).

Specimen data. Quebec: RCM Brome-Missisquoi, Saint-Armand, 12.vii.2008, P. Bélanger, UV light (1, LEMQ).

***Tyloderma foveolatum* (Say, 1832), new to Manitoba**

Note. This widespread native eastern USA and eastern southern Canadian species has been associated with *Oenothera biennis* L. (Onagraceae), a native ruderal plant (Wibmer 1981).

Specimen data. Manitoba: Eastern Manitoba, Sandilands Provincial Forest, Marchand (10–12 km E.), 10–12.vi.1987, H. & A. Howden (1, CMNC); Spruce Woods Provincial Park, Glenboro (10–15 km W.), 17.vi.1987, H. & A. Howden (3, CMNC).

Subfamily Cyclominae Schönherr, 1826
Tribe Listroderini LeConte, 1876

***Listronotus maculicollis* (Kirby, 1837), new to Manitoba**

Note. This transcontinental North American native species is recorded from Manitoba for the first time. It is associated with wetlands.

Specimen data. Manitoba: Aweme at Assiniboine River, 49.673°N, 99.565°W, 11.vii.2003, R.P. Webster (1, RWC).

***Listronotus punctiger* LeConte, 1876, new to Manitoba**

Note. This western North Americans native pecies is recorded from Manitoba for the first time. It is associated with wetlands.

Specimen data. Manitoba: near Junction Highways 21 & 543 N, 49.6705°N, 100.4646°W, 6.vii.2007, sweeping, R.P. Webster (1, RWC).

Subfamily Entiminae Schönherr, 1823
Tribe Cyphicerini Lacordaire, 1863

***Cyrtepistomus castaneus* (Roelofs, 1873), new to Quebec**

Note. This adventive Palaearctic species is widespread in the eastern USA into Ontario and is known in USA as the Asiatic oak weevil; it can be extremely common locally (Anderson 2002), and acts as a minor defoliator of broadleaved trees.

Specimen data. Quebec: RCM La Côte-de-Gaspé, Gaspé, 27.viii.1966, W. Boyle (1, LEMQ).

Tribe Naupactini Gistel, 1848

***Atrichonotus taeniatulus* (Berg, 1881), new to Canada**

Note. This adventive species, the adults of which feed on the roots and foliage of a variety of host plants (although most frequently on Fabaceae), was known previously in North America from southeastern USA west to Texas (Anderson 2002). This species can be an important pest of alfalfa (*Medicago sativa* L., Fabaceae).

Specimen data. Quebec: MRC La Vallée-du-Richelieu, Mont-Saint-Hilaire, 25.v.1999, H. Miquet-Sage (1, CHMS).

Tribe Otiorhynchini Schönherr, 1826

***Otiorhynchus ligustici* (Linnaeus, 1758), new to Quebec**

Note. This adventive Palaearctic species was known in Canada only from Ontario (Bright and Bouchard 2008). Also known as the alfalfa snout beetle this species is a major pest of alfalfa.

Specimen data. Quebec: MRC Beauharnois-Salaberry, Salaberry-de-Valleyfield, 13.vi.2012, on grasses under *Salix*, *Populus* and *Vitis riparia*, Y. Racine (1, CPTO).

Subfamily Lixinae Schönherr, 1823
Tribe Lixini Schönherr, 1823

***Larinus planus* (Fabricius, 1792), new to Quebec**

Note. This adventive Palaearctic species was introduced to North America for the biological control of Canada thistle, *Cirsium arvense* (L.) Scop. (Asteraceae) (Anderson 2002). It is present in Alberta, British Columbia, Nova Scotia and Ontario.

Specimen data. Quebec: MRC Marguerite-D'Youville, Varennes (Verchères), 25.viii.2001, 6.ix.2001, 16.viii.2004, 12.vi.2006, 13.vi.2006, C. Chantal (8, CCCH); MRC Vaudreuil-Soulanges, Notre-Dame-de-l'Île-Perrot, 20.vi.2009, 21.vi.2009, 30.viii.2009, 30.viii.2012, all on *Cirsium arvense*, P. de Tonnancour (6, CPTO); Montreal, Sainte-Anne-de-Bellevue, 25.vi.2010, 7.vi., 11.vi.2011, on *Cirsium arvense*, P. de Tonnancour (12, CPTO).

Subfamily Mesoptiliinae Lacordaire, 1863
Tribe Magdalidini Pascoe, 1870

***Magdalis inconspicua* Horn, 1873, new to New Brunswick**

Note. This native eastern North American species is recorded from the Maritime Provinces for the first time. It is associated with forest habitats.

Specimen data. New Brunswick: Sunbury County, Gilbert Island, 45.8770°N, 66.2954°W, 29.vi.–11.vii.2012, Lindgren traps in canopy of *Juglans cinerea* & *Tilia americana*, and under *Tilia americana*, C. Alderson & V. Webster (2, AFC; 1, CMNC; 1, NBM; 7, RWC); Carleton County, Jackson Falls, Bell Forest, 46.2200°N, 67.7231°W, 7–21.vi.2012, Lindgren traps in *Tilia americana* canopy, C. Alderson & V. Webster (1, CMNC; 1, RWC).

***Magdalis salicis* Horn, 1873, new to New Brunswick**

Note. This native eastern North American species is recorded from New Brunswick for the first time. It is associated with forest habitats.

Specimen data. New Brunswick: Queens County, Grand Lake Meadows PNA, 45.8227°N, 66.1209°W, 21.vi-5.vii.2011, Lindgren trap in canopy, M. Roy & V. Webster (1, RWC); Sunbury County, Gilbert Island, 45.8770°N, 66.2954°W, 12.vii.2012, sweeping, R.P. Webster (1, RWC).

Subfamily Molytinae Schönherr, 1823
Tribe Conotrachelini Jekel, 1865

***Microhyus setiger* LeConte, 1876, new to Quebec**

Note. Adults of this widespread native eastern USA (and into Ontario) species have been associated with dead *Fagus* (Fagaceae, beech) (Anderson 2002).

Specimen data. Quebec: MRC Deux-Montagnes, Oka, Parc d'Oka, 30.v.1995, R. Vigneault (1, CRVI); Brome-Missisquoi, Saint-Armand, 9.vi.2003, Claude Chantal (1, CCCH); MRC Marguerite-D'Youville, Varennes (Verchères), 6.vi.2011, C. Chantal (1, CCCH).

Subfamily Scolytinae Latreille, 1804

The Scolytinae, or bark beetles are a distinctive and relatively well-known subfamily that includes many forest pests. Scolytinae have been a focus of adventive forest pest trapping surveys by the Canadian Food Inspection Agency, the Canadian Forest Service and others. The taxonomy and distribution of species that are not readily captured in traps, or attack smaller diameter stems remain less well-known.

Tribe Dryocoetini Lindemann, 1877

***Dryocoetes autographus* (Ratzeburg, 1837), new to Nova Scotia**

Note. This widespread native species, known from all other provinces and two territories, attacks the lower parts of dead and dying conifers. The absence of records from Nova Scotia seems to be an oversight.

Specimen data. Nova Scotia: Colchester Co., Portapique, 45.405°N, 63.704°W, 26.vii.1927, C.A. Frost (1, CNCI), CNC Diptera 126927; Kejimkujik National Park, 44.386°N, 65.293°W, 17.vii.1970, ex. *Picea glauca*, D.E. Bright (2, CNCI), CNC Diptera 127810, 127811; St. Ann's Gut, 46.217°N, 60.616°W, 3.viii.1970, ex. *Picea*, D.E. Bright (2, CNCI), CNC Diptera 127830, 127831; White point, 46.883°N, 60.363°W, 23.vi.1983, Y. Bousquet (1, CNCI), CNC Diptera 128020, 128021, 128022; Cape Breton Highlands National Park, Lone Shieling, 46.897°N, 60.783°W, 1.vii.1983, R. Vockeroth, L. Lesage, Y. Bousquet (2, CNCI), CNC Diptera 128037, 128038, 128072; Cape Breton Highlands National Park, Jack Pine Trail, 46.779°N, 60.333°W, 22.vii.1983, D.E. & J.E. Bright (1, CNCI), CNC Diptera 128028; Halifax, Point Pleasant Park, 46.822°N, 60.799°W, 13.vi.–5.vii.1990, S. Robertson & G Harding (4, CNCI), CNC Diptera 127944, 127945, 127946, 127947.

***Dryocoetes caryi* Hopkins, 1915, new to Prince Edward Island**

Note. This rarely collected native species typically inhabits small, stressed *Picea* spp. (Pinaceae) trees and is known from across Canada (Alberta, British Columbia, New Brunswick, Nova Scotia, and Quebec) Bright 1976, Webster et al. 2012).

Specimen data. Prince Edward Island, Queens Co., Charlottetown, 23.vi.–7.vii.2000, funnel trap, CFIA (1, CNCI).

***Lymantor alaskanus* Wood, 1978, new to Canada**

Note. This native species was only known from the type series, collected in 1978 near Fairbanks Alaska. The Alberta specimens mentioned here represent a significant extension of the known range to the south and east. Both the type series and all specimens reported here were captured in CFIA traps baited with ipsenol lure.

Specimen data. Alberta: RM (Regional Municipality) of Wood Buffalo, 56.733°N, 111.384°W, 7.vii.2005, funnel trap with ipsenol, CFIA (3, CNCI), CNC COLEO 00106296, 00106297; RM of Wood Buffalo, 56.733°N, 111.384°W, 28.iv.–29.ix.2005, funnel trap (2, CFIA), CNCI, CNC COLEO 00106298.

Tribe Hylastini LeConte, 1876

***Hylastes macer* LeConte, 1868, new to Alberta**

Note. This western species feeds mainly on *Pinus* spp. (Pinaceae), and was already known from nearby parts of British Columbia (Bright 1976).

Specimen data. Alberta: Calgary, 51.042°N, 114.078°W, 11.vi.1944, in flight, E.J. Kitely (1, CNCI), CNC Diptera 129000.

***Hylastes opacus* Erichson, 1836, new data on first Canadian and Quebec records**

Note. These records of this adventive, *Pinus*-feeding Palaearctic species (also known from New Brunswick, Webster et al. 2012) were reported by Bright and Skidmore (1997) without specimen data.

Specimen data. Ontario: Elgin Co., Port Bruce, 42.650°N, 81.017°W, 19.iv.1995, J. Hale (2, CNCI), CNC COLEO 00105928, 00105929; **Quebec:** Montreal, 45.500°N, 73.600°W, 6.vi.1997, D. Couture (2, CNCI), CNC COLEO 00105926, 00105927.

Tribe Hylurgini Gistel, 1848

***Dendroctonus ponderosae* Hopkins, 1902, new to Alberta**

Note. The native, *Pinus*-feeding mountain pine beetle has not previously been reported from Alberta in the taxonomic literature despite well-studied, costly outbreaks there. Specimens listed here document the oldest CNCI material from Canada outside British Columbia.

Specimen data. Alberta: Waterton Lakes National Park, Summit-Carthew Lakes Trail, 49.033°N, 113.984°W, 17.vi.1980, J.M Campbell & D.E. Bright (6, CNCI), CNC Diptera 130912–130917; Waterton Lakes National Park, km 3 Chief Mountain Highway, 17.vi.1980, J.M. Campbell (1, CNCI), CNC Diptera 130911; Waterton Lakes National Park, Red Rock Canyon, 49.133°N, 113.018°W, 16.vii.1980, ex. *Pinus contorta*, D.E. Bright (1, CNCI), CNC Diptera 130910; Waterton Lakes National Park, km 9 Chief Mountain Highway, 24.vii.1980, ex. *Pinus contorta*, D.E. Bright (3, CNCI), CNC Diptera 130918–130920; Waterton Lakes National Park, Cameron Lake, 49.017°N, 114.067°W, 30.vii.1980, D.E. Bright (4, CNCI), CNC Diptera 130902–130905; Waterton Lakes National Park, Belly River, 49.767°N, 113.034°W, 30.vii.1980, D.E. Bright (4, CNCI), CNC Diptera 130906–130909.

***Dendroctonus simplex* LeConte, 1868, new to Yukon and Nunavut: not known from Northwest Territories**

Note. The native eastern larch beetle is reported from all ten provinces, and Northwest Territories (Bright 1976). With the separation of Nunavut from Northwest Territories, the single Northwest Territories record should become a Nunavut record.

Specimen data. Nunavut: Keewatin, Padlei, 61.933°N, 96.650°W, 27.vii.1950, R.E. Duckworth (1, CNCI), CNC COLEO 00100743; **Yukon:** Km 382, Dempster Highway, 66.386°N, 136.317°W, 23.vi.1981, D.E. Bright (1, CNCI), CNC Diptera 132434.

***Tomicus piniperda* (Linnaeus, 1758), new data on first Canadian record, and first Quebec record**

Note. These records of this adventive Palaearctic species, the pine shoot beetle, were reported by Bright and Skidmore (1997) without specimen data.

Specimen data. Ontario: Haldimand Co., Dunnville, 42.904°N, 79.618°W, iv.1993, Agriculture Canada (8, CNCI), CNC Diptera 128768 to 128775; Haldimand Co., Dunnville, 42.904°N, 79.618°W, 23.vi.1993, ex. bole of *Pinus sylvestris*, D.E. Bright (12, CNCI), CNC Diptera 128776 to 128782; **Quebec:** Gatineau, Aylmer, 45.400°N, 75.817°W, 9.vii.1993, ex. bole *Pinus sylvestris*, D.E. Bright (1, CNCI), CNC Diptera 128783.

Tribe Ipini Bedel, 1888

***Ips perroti* Swaine, 1915, new to Nova Scotia**

Note. This native species breeds in thin-barked *Pinus* spp. stems, and is known from Alberta, British Columbia, Manitoba, New Brunswick, Ontario, Quebec, and Saskatchewan.

Specimen data. Nova Scotia: Cape Breton, Bras d'Or, 46.250°N, 60.282°W, 1–21.vi.2000, ex. funnel trap, CFIA (1, CNCI), CNC COLEO 00105995.

Tribe Micracidini LeConte, 1876

***Hylocurus rudis* (LeConte, 1876), new to Canada**

Note. This native species breeds in weakened or dead small diameter stems of hardwood trees. Its apparent limitation to southern Ontario and Quebec is probably due to climate, given that it is also known from Michigan, Ohio and Pennsylvania (Wood and Bright 1992).

Specimen data. Ontario: Essex Co., Pt. Pelee National Park, Visitor's Centre, 22–29.v.2000, O. Lonsdale (1, DEBU), debu01000657; Essex Co., Middle Island, 40°41'N, 82°41'W, 4.vii.2000, ex. yellow pans etc., Paiero, Marshall, & Cheung (4, DEBU), debu00221910, debu00222016, debu00221976, debu00221526; Essex Co., Middle Island, 40°41'N, 82°41'W, 11.vi.2003, S.A. Marshall (1, DEBU), debu00221012; Essex Co., Pt. Pelee National Park, The Tip, 17.vi.2003, H. Carscadden (1, DEBU), debu00219553; Halton, Oakville, 43.450°N, 79.683°W, 9–23.vi.2008, ex. funnel trap, CFIA (1, CNCI), CNC COLEO 00105968; **Quebec:** MRC Deux-Montagnes, Oka, Parc d'Oka, Deux-Montagnes, 27.iv.1997, reared ex. *Carya ovata* R. Vigneault, (1, CRVI).

***Micracis suturalis* LeConte, 1868, new to Ontario**

Note. This native species breeds in *Cercis* spp. (Fabaceae), *Juglans* spp. (Juglandaceae), and other broadleaved trees (Bright 1976), and is already known from Quebec (Chantal 1992).

Specimen data. Ontario: Kent Co., Rondeau Provincial Park, 1.vi.1982, D.E. Bright (1, CNCI), CNC COLEO 00155768.

***Pseudothysanoes rigidus* (LeConte, 1876), new data on first Ontario record**

Note. This native species, known from USA, breeds in *Tilia* sp. (Malvaceae), and has been previously reported from Ontario without additional data (Bright 1976).

Specimen data. Ontario: RM Halton, Burlington, Sheldon Creek Woodlot, 43.396°N, 79.775°W, 1–14.vi.2007, ex. funnel trap, CFIA (1, CNCI), CNC COLEO 00106106.

Tribe Phloeosinini Nüsslin, 1912

Phloeosinus pini Swaine, 1915, new to Ontario

Note. This widespread (Alberta, British Columbia, Manitoba, Quebec, Northwest Territories, Nova Scotia, Yukon), but infrequently collected native species breeds in *Pinus* and *Picea* (Bright 1976).

Specimen data. Ontario: Lennox and Addington Co., Napanee, 44.267°N, 76.971°W, 20.v.2004, ex. funnel trap, CFIA (1, CNCI).

Tribe Phloeotribini Chapuis, 1869

Phloeotribus liminaris (Harris, 1852), new to Saskatchewan

Note. The peach bark beetle breeds in *Prunus* spp., is native and already known from neighbouring Manitoba, and also Ontario, Quebec, New Brunswick, and Nova Scotia (Bright 1976, Majka et al. 2007).

Specimen data. Saskatchewan: Saskatoon, Avenue K. S., vi.2011. J. Boone (1, City of Saskatoon).

Phloetribus piceae Swaine, 1911, new to Yukon

Note. This infrequently collected boreal species breeds in *Picea* spp (Bright 1976), and was known from British Columbia, Manitoba, Ontario, Quebec, New Brunswick, Nova Scotia, and Northwest Territories.

Specimen data. Yukon: Km 72, Dempster Highway, 64.53°N, 138.231°W, 20.vi.1981, ex. *Picea glauca*, D.E. Bright (6, CNCI), CNC COLEO 00104642, CNC Diptera 130333–130336.

Phloeotribus scabricollis (Hopkins, 1916), new to Canada

Note. This rarely collected species breeds in *Ptelea trifoliata* L. (Rutaceae) and *Staphylea trifolia* L. (Staphyleaceae) (Wood 1982).

Specimen data. Ontario: Essex Co., Pelee Island, 11.vi.2003, J. Ambrose (1, DEBU), 00137345.

Tribe Scolytini Latreille, 1804

***Scolytus multistriatus* (Marsham, 1802), new data on first Alberta record**

Note. This record of this adventive Palaearctic species was reported by Bright and Skidmore (1997) without specimen data. *Scolytus multistriatus* is a pest of *Ulmus* spp., and also known from British Columbia, Manitoba, Ontario, Nova Scotia, Quebec, and Saskatchewan.

Specimen data. Alberta: Calgary, 51.050°N, 114.084°W, 19.vii.1994, T. Reichardt (2, CNCI), CNC Diptera 134316 to 134317; Edmonton, 53.554°N, 113.406°W, 6.vii.–14.viii.1995, C. Brososky (1, CNCI), CNC Diptera 134314.

***Scolytus oregoni* Blackman, 1934, new to Canada**

Note. This infrequently collected native species breeds in *Pseudotsuga* sp. in USA (Wood 1982).

Specimen data. British Columbia: Vancouver Island, Victoria, 48.541°N, 123.469°W, 11–25.viii.2009, ex. funnel trap, CFIA, (3, CNCI).

***Scolytus piceae* (Swaine, 1910), new to Newfoundland**

Note. This infrequently collected native species breeds mainly in *Picea* spp. (Bright 1976). It is otherwise known from all other provinces and territories except for Prince Edward Island.

Specimen data. Newfoundland: Humber District–Corner Brook, 12 mi NE Deer Lake, 49.318°N, 57.212°W, 23.vii.1970, ex. *Picea mariana*, D.E. Bright (1, CNCI), CNC Diptera 133720.

***Scolytus rugulosus* (Müller, 1818), new data on first Canadian record**

Note. This adventive Palaearctic species was apparently reported from Canada in Ontario by Chamberlin (1939) without specimen data. It breeds in *Malus*, *Prunus* and *Pyrus* trees.

Specimen data. Ontario: Prince Edward Co., 2.vii.1917, J.F. Brimley (1, CNCI), CNC Diptera 133735.

***Scolytus schevyrewi* Semenov Tjan-Shansky, 1902, new to Alberta, Saskatchewan, Manitoba, and Ontario**

Note. This adventive Palaearctic species is known from British Columbia (Humble et al. 2010), and breeds in elms, particularly damaging the adventive *Ulmus pumila* (Ulmaceae).

Specimen data. Alberta: Medicine Hat, Gershaw Avenue, 1–30.ix.2006, ex. funnel trap, CFIA (1, CNCI), CNC COLEO 00105817; **Manitoba:** RM De Salaberry Otterburne, 49.973°N, 97.052°W, 2007, ex. funnel trap, CFIA, (2, CNCI), CNC COLEO 00106339, 00106340; **Ontario:** RM Peel, Mississauga, 43.711°N, 79.722°W, 6–19.viii.2008, ex. funnel trap, CFIA (1 CNCI); RM Hamilton, 43.269°N, 79.83°W, 29.v.–11.vi.2012, ex. funnel trap, CFIA (1, no voucher retained); Lambton Co., Sarnia, 43.986°N, 82.410°W, 11–25.vi., 30.vi.–11.vii.2012, ex. funnel trap, CFIA (2, CNCI); **Saskatchewan:** Maple Creek, 49.917°N, 109.484°W, 21.iv.2007, ex. funnel trap, CFIA (1, CNCI), CNC COLEO 00105818; Regina, v.–vii.2007, ex. funnel trap, CFIA (1, CNCI), CNC COLEO 00106339 (specimens also examined from Assiniboia, Eston, Estevan, Moose Jaw, Shaunavon, Weyburn, Yorkton).

Tribe Xyleborini LeConte, 1876

Members of this tribe are obligate symbionts of fungi, which they introduce and cultivate in the xylem of their woody hosts.

Euwallacea validus (Eichhoff, 1875), new to Canada

Note. This adventive species has been present in North America since 1976 and has since spread within the eastern USA (Rabaglia et al. 2006). *Euwallacea validus* breeds in a variety of broadleaved and conifer trees, and its pest-status remains unclear.

Specimen data. Ontario: Essex Co., Windsor, Bloomfield & Watkins, 42.291°N, 83.076°W, 4.ix.2004, ex. *Ailanthus altissima*, E. Czerwinski (2, CNCI), CNC COLEO 00105866, 00105867; Niagara, Douglastown, 42.974°N, 79.018°W, 22.xi.2005, ex. *Pinus sylvestris*, L. Tucker (1, CNCI), CNC COLEO 00106198.

Xyleborinus attenuatus (Blandford, 1894), new to Nova Scotia, Ontario and Quebec

Note. This adventive species, which was until recently known mainly by the synonym *X. alni* Niisima, is a recent arrival in North America (Mudge et al. 2001). It was found soon after initial detection in much of NE and NW USA and British Columbia and Prince Edward Island. *Xyleborinus attenuatus* feeds on woody angiosperms, and its pest-status remains unclear.

Specimen data. Nova Scotia: Halifax, 44.738°N, 63.546°W, 29.v.–12.vi.2007, ex. funnel trap, CFIA (2, CNCI), CNC COLEO 00106125, 00106126; **Ontario:** Middlesex Co., London, 42.983°N, 81.233°W, 27.iv.1998, ex. funnel trap, CFIA (2, CNCI), CNC COLEO 00106144, 00106145; **Quebec:** Sherbrooke, 45.417°N, 71.900°W, 20.v.–2.vi.2009, ex. funnel trap, CFIA (1, CNCI), CNC COLEO 00106128.

Xyleborus affinis Eichhoff, 1868, new to Quebec

Note. This apparently native species is already known from neighbouring Ontario and New York State (Rabaglia et al. 2006), and breeds in deciduous trees.

Specimen data. Quebec: MRC Deux-Montagnes, Oka, Parc d'Oka, Lac de la Sauvagine, 2.xi.2002, R. Vigneault (2 CNCI; 23, CRVI), CNC Diptera 125448, 125449.

Xyleborus celsus Eichhoff, 1868, new to Canada

Note. This native species breeds in *Carya* spp. (Juglandaceae) in the USA (Rabaglia et al. 2006). In Canda these trees occur in only southern parts of Ontario and Quebec.

Specimen data. Ontario: Kent Co., Rondeau Provincial Park, 42.329°N, 81.846°W, 9.vi.1980, H. Goulet (1, CNCI), CNC Diptera 125451; Kent Co., Rondeau Provincial Park, Visitor's Centre, 42.781°N, 81.844°W, 3.vii.2003, S.M. Paiero (1, DEBU), debu01119222; Middlesex Co., London, 43.090°N, 81.187°W, 13.viii.2006, ex. sticky trap, K. Nystrom (1, CNCI; 1, GLFC), CNC COLEO 00106117.

Xyleborus ferrugineus (Fabricius, 1801), new to Canada

Note. This apparently native species, feeds in a wide variety of woody plants, and is known in the USA from nearby Michigan, New York, Ohio and Pennsylvania, and is also present as an adventive on other continents (Rabaglia et al. 2006).

Specimen data. Ontario: Kent Co., Rondeau Provincial Park, 11–25.v.1985, flight intercept trap in maple-beech forest, L. Lesage and A. Woodliffe, (1, CNCI).

Xylosandrus crassiusculus (Motschulsky 1866), new to Canada

Note. This east-Asian species is known from throughout the eastern USA (Rabaglia et al. 2006), including nearby Ohio (Lightle et al. 2007) and Michigan (Cognato et al. 2009), from as far north as 45.350°N. This species breeds in many broadleaved woody plants and is a pest in the USA in apparently healthy nursery material and fruit trees. (Kovach and Gorsuch 1985, Oliver and Mannion 2001)

Specimen data. Ontario: Elgin Co., 42.826°N, 81.288°W, 11–25.vi., 12–26.vii., 10–24.viii., 18.ix.–2.x.2012, ex. funnel trap, CFIA (27, CNCI).

Xylosandrus germanus (Blandford, 1894), new data on first Quebec record

Note. This adventive Palearctic species was first reported from Quebec by Bright and Skidmore (2002) without reference to specimens. The following is to document these

first-known captures of this species in Quebec. *Xylosandrus germanus* feeds in both broad leaved and conifer trees.

Specimen data. Quebec: MRC Longueuil, Saint-Bruno-de-Montarville, Mont St-Bruno, 45.55°N, 73.316°W, 30.v.–5.vi., 5–12.vi., 12–19.vi., 19–26.vi., 26.vi.–2.vii., 2–12.vii., 12–17.vii., 17–24.vii., 24.vii.–1.viii., 1–8.viii.2000, G. Pelletier (18 CNCI), CNC Diptera 128373 to 128391.

Discussion

McNamara (1991) provided a comprehensive list of Curculionoidea known from Canada and its provinces at that time. Noteworthy additions to our knowledge of the Canadian weevil fauna in the last 20 years include the works published by Bright (1993, 1994), Bouchard et al. (2005), Bright and Skidmore (1997), Anderson (1997), Chantal (1998), Anderson (2002), Anderson and Korotyaev (2004), Rabaglia et al. (2006), Majka and Anderson (2007), Majka et al. (2007a–c), Bright and Bouchard (2008), Humble et al. (2010), Klimaszewski et al. (2010), De Clerck-Floate and Cárcamo (2011), Webster et al. (2012), Bouchard et al. (2012), Humble and Hueppelsheuser (2012) and Looney et al. (2012). Beyond these, we list 24 species new to Canada, in ten cases also representing new records at the generic level. We have also added 59 species new to 12 provinces and territories. These records include 10 pest species and six species introduced elsewhere as biological control agents. Some are new records of adventive species expanding their range, others may be northward expansions of species common in the USA, and many fill gaps within the patchy known distributions of infrequently collected native species.

The present review of collections material for new distributional records was undertaken in anticipation of the new checklist of Canadian Coleoptera (Bousquet et. al 2013). Except for the maratimes provinces, which are now receiving increased faunistic research (e.g. Majka and Anderson (2007), Majka et al. (2007a–c), Webster et al. (2012)), our understanding of most other beetle families would also benefit from such a review. It is also probable that further undocumented curculionoid first records remain to be gleaned from material at Canadian insect collections which we were unable to include in this study.

The range extension for *Asperosoma echinatum* from Manitoba into southern Ontario is partidularly interesting. It is very uncommon for species to be endemic to Canada but this is an example where both the genus and species are, at present, known only from Canada. Possible other host plants in the genus *Heuchera* (Saxifragiaceae) are widespread in North America and the weevil may be more widely distributed than currently known. Whether or not a Canadian endemic, it is a little-known and possibly at-risk species that is worth searching for.

Acknowledgements

This work represents the research activities of many people and organizations: field collecting, sorting trap samples, preliminary identifications, and providing loans, as

part of their ongoing efforts to document their regional insect fauna. Some bark beetle records are based on CNCI specimens that D.E. Bright had identified. The authors thank I. Nei and K. McLachlan-Hamilton for assisting with identifications; Jeff Boone (City of Saskatoon), Stéphanie Boucher (LEMQ), Claude Chantal (CCCH), CFIA's Plant Health Survey Unit and inspectors, Tom Hutchison and Sunil Ranasinghe (Alberta Environment and Sustainable Resource Development), Serge Laplante (CSLA), Rory McIntosh (Saskatchewan Ministry of Environment), Kathryn Nystrom (Great Lakes Forestry Centre), Steven Paiero (DEBU), and Irene Pines (Manitoba Conservation) for providing specimens (often already identified). We thank Chantal Alderson, Vincent Webster and Cory Hughes for assistance in collecting Coleoptera in New Brunswick. Jon Sweeney (Natural Resources Canada, Canadian Forest Service), CFIA, and USDA APHIS are thanked for funding surveys in New Brunswick. Bruce Gill,Troy Kimoto, D. McQuorquodale, and one anonymous reviewer provided helpful comments on the manuscript.

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ZooKeys 309: 49–66 (2013)
doi: 10.3897/zookeys.309.5318
www.zookeys.org

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An annotated update of the scale insect checklist of Hungary (Hemiptera, Coccoidea)

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Academic editor: *Roger Blackman* | Received 15 April 2013 | Accepted 23 May 2013 | Published 13 June 2013

Citation: Kozár F, Konczné Benedicty Z, Fetykó K, Kiss B, Szita É (2013) An annotated update of the scale insect checklist of Hungary (Hemiptera, Coccoidea). ZooKeys 309: 49–66. doi: 10.3897/zookeys.309.5318

Abstract

The number of scale insect species (Hemiptera: Coccoidea) known from Hungary has increased in the last 10 years by 39 (16.6 %), to a total of 274 species belonging to 112 genera in10 families. The family Pseudococcidae is the most species rich, with 101 species in 34 genera; Diaspididae contains 59 species in 27 genera; Coccidae contains 54 species in 27 genera; and the Eriococcidae contains 33 species in 8 genera. The other 6 coccoid families each contain only a few species: Asterolecaniidae (7 species in 3 genera); Ortheziidae (7 species in 4 genera); Margarodidae *sensu lato* (5 species in 5 genera); Cryptococcidae (3 species in 2 genera); Kermesidae (4 species in 1genus); and Cerococcidae (1 species). Of the species in the check list, 224 were found in outdoor conditions, while 50 species occurred only in indoor conditions. This paper contains 22 species recorded for the first time in the Hungarian fauna.

Keywords

Introduced pests, insect invasion, distribution, taxonomy, Palaearctic Region

Introduction

Scale insects (Hemiptera: Coccoidea) live on a wide variety of plant species and many of them are important agricultural pests. Publication of new knowledge of this insect group is therefore very important from a practical viewpoint. The distribution data of different species may serve also as a reliable biodiversity indicator in different ter-

ritories, such as nature reserves and agricultural or urban landscapes. The distribution data may also reflect the progress of climatic changes (Kozár 1997; 2009; Kozár et al. 2004; Kozár et al. 2009).

The world distribution of insect pests has changed greatly in recent decades, mainly due to increasing international trade in plant material. Scale insects are particularly well adapted to accidental introduction because their habits are often cryptic, so they can escape detection during quarantine inspections (Muniappan et al. 2009). Specifically, in recent years intensive scale insect invasions have been observed in several parts of Europe. In parallel, the number of species detected in the continent increased substantially, both outdoors and in indoor conditions such as greenhouses, commercial fruit stores and nurseries (Ben-Dov et al. 2013; Fetykó and Kozár 2012; Fetykó and Szita 2012; Malumphy and Badmin 2012; Pellizzari and Germain 2010).

Early data on the distribution of scale insects in Hungary were summarized by Kosztarab and Kozár (1978; 1988) and by Kozár (1998). The last check list of the scale insects of Hungary (Kozár 2005) reported 235 species and provided distribution maps. At the same time, the international ScaleNet database contained 206 scale insect species recorded from Hungary (Ben-Dov et al. 2013). Since the work of Kozár (2005), 17 new scale records from Hungary have been published (Fetykó and Kozár 2012; Fetykó and Szita 2012; Klupács and Volent 2012; Kozár 2004; 2009; Kozár et al. 2012; Kozár et al. in preparation; Kozár et al. 2004; Kozár and Konczné Benedicty 2005; 2007; Kozár et al. 2009). In the present paper we provide the latest checklist of scale insect species found in Hungary, and give a zoogeographic analysis of the known fauna of Central Europe and surrounding countries.

Scale insect species in Hungary are grouped into three categories. True members of the Hungarian fauna can be found regularly in outdoor habitats and typically overwinter outdoors. The second category of species is generally found in greenhouses or other buildings, mainly on ornamental plants. These introduced species are, in some cases, well-established in Hungary and may occur regularly, but are unable to overwinter outdoors. The third category consists of relatively few, introduced species that occur typically on imported tropical or subtropical fruits for consumption. Some of these species have not been able to establish at all, even in greenhouses, despite repeated introductions over several decades. All the species in the following checklist are assigned to one of these three categories.

Materials and methods

The list below is based on the collection data of the authors between 2003 and 2013 and includes earlier records from Kozár (2005). In this ten-year period, 4738 scale insect samples were studied (Kozár's collection index numbers 6097–0835). The samples originated from both outdoors and indoors, i.e. field trips, greenhouses, botanical gardens, nurseries, imported fruits and indoor ornamental plants.

The scales were mounted on microscope slides following the method described by Kosztarab and Kozár (1988). Voucher specimens, mainly in form of microscope slides, can be found in Kozár's collection in the Plant Protection Institute at the Centre for Agricultural Research of the Hungarian Academy of Science.

The nomenclature of the scale insects has frequently been changed, even within the last decade. The scientific names used below therefore are annotated to relate them to those that were used in earlier Hungarian publications. We have endeavoured to maintain conformity with our previous works, as well as with the international scale insect database on "ScaleNet" (Ben-Dov et al. 2013). The taxonomic status of the families Margarodidae and Pseudococcidae are subject to current research, so these families in their wider circumscription are dicussed here as Margarodidae *sensu lato* and Pseudococcidae *sensu lato***.**

For the zoogeographical and zoological subregion of Central Europe, we used the Palaearctic concept of Emeljanov (1974). Species richness data of different countries was based on the ScaleNet database (Ben-Dov et al. 2013), and published local checklists were used for comparison purposes (Fetykó et al. 2010; Foldi 2001; Gertsson 2001; Jansen 1999; Kozár 2005; Kozár et al. 1994; Kozár et al. in preparation; Lagowska 2001; Masten-Milek and Simala 2008; Pellizzari and Russo 2004; Schmutterer 2008; Seljak 2010; Tereznikova 1975; 1981; 1986).

Results and discussion

The number of scale insect species in Hungary has increased by 39 (16.6 %) in the last ten years, and currently totals 274 species in ten families (Tables 1 and 2). The largest families in order of species richness are: Pseudococcidae with 101 species, Diaspididae (59 species), Coccidae (54 species) and Eriococcidae with 33 species. The new species to the Hungarian fauna recorded here belong to the Pseudococcidae, Diaspididae and Eriococcidae. Most of the species in the checklist (224; 81.75 %) are native and live outdoors. The check list contains 50 introduced (generally cosmopolitan) species, mainly occurring indoors in Hungary on ornamental plants in greenhouses and buildings. Of these indoor species, 33 occurred only in greenhouses or buildings (mainly on ornamental plants) and 7 were found exclusively on imported tropical/subtropical fruits for consumption. Four of the species living in greenhouses sometimes also occur outdoors. Four other species, which are typically found on imported fruit, also appear in greenhouses from time to time. Two of the newly recorded species were found on imported nursery plant material. In the present list, 22 species are new to the Hungarian fauna. According to these data, Hungary is the most scale-insect-species-rich country in in Central Europe (Fig. 1).

No species should be considered as truly endemic only on the basis of its presence in a checklist, because the lack of a species in the surrounding countries is most likely due to inadequate exploration of those areas (Fig. 1). Out of the above list,

Table 1. The number of scale insect species in different categories.

	Number of species	%
New to the Hungarian fauna	22	8.03
Only found outdoors	224	81.75
Introduced on propagation plant material (outdoor conditions)	2	0.73
Only found indoors (in greenhouses and buildings)	33	12.40
Only found on imported fruit	7	2.55
Mainly found in greenhouses	4	1.46
Mainly on imported fruits, but occasionally in greenhouses	4	1.46
Total	274	-

Table 2. Updated checklist of scale insects (Homoptera: Coccoidea) of Hungary (2013), with comments and nomenclatural changes. Information on the original decriptions of species can be found in ScaleNet database (Ben-Dov et al. 2013).

Taxon	Comment
Asterolecaniidae (3 genera)	
Asterodiaspis bella (Russell, 1941)	
Asterodiaspis quercicola (Bouché, 1851)	
Asterodiaspis roboris (Russell, 1941)	
Asterodiaspis variolosa (Ratzeburg, 1870)	
Asterodiaspis viennae (Russell, 1941)	
Asterolecanium epidendri (Bouché, 1844)	
Planchonia arabidis Signoret, 1877	Previously recorded as *Asterolecanium fimbriatum* (Leonardi, 1920).
Cerococcidae (1 genus)	
Cerococcus cycliger Goux, 1932	
Coccidae (27 genera)	
Ceroplastes japonicus Green, 1921	Found in Hungary in 2011 (Klupács and Volent 2012).
Ceroplastes rubens Maskell, 1893	Found in Hungary in 2011 (Fetykó and Kozár 2012).
Ceroplastes rusci (Linnaeus, 1758).	According to Kosztarab (1955) the latest record of this species in Hungary was published in 1883. Has probably disappeared.
Chloropulvinaria floccifera (Westwood, 1870)	
Coccus hesperidum Linnaeus, 1756	Found on *Maclura* sp. outdoors in recent years in Hungary (Velence) (Salamon and Tőkés 2010). Overwintering method not known.
Eriopeltis festucae (Fonscolombe, 1834)	
Eriopeltis lichtensteini Signoret, 1876	
Eriopeltis stammeri Schmutterer, 1952	
Etiennea villiersi Matile-Ferrero, 1984	It has not been found since its first record (Kozár 2005), and has probably disappeared.
Eucalymnatus tessellatus (Signoret, 1873)	
Eulecanium ciliatum (Douglas, 1891)	
Eulecanium franconicum (Lindinger, 1912)	
Eulecanium tiliae (Linnaeus, 1758)	Previously recorded as *Eulecanium mali* (Schrank, 1781).
Eupulvinaria hydrangeae (Steinweden, 1946)	
Exaeretopus formiceticola Newstead, 1894	
Exaeretopus mahunkai Kozár & Drozdják, 1990	
Gascardia hodgsoni Matile-Ferrero & Le Ruyet, 1985	It has not been found since its first record (Kozár 2005), and has probably disappeared.

Taxon	Comment
Lecanopsis formicarum Newstead, 1893	Previously recorded as *L. terrestris* Borchsenius, 1952.
Lecanopsis subterranea (Gomez Menor Ortega, 1948	Previously recorded as *L. festucae* Borchsenius, 1952.
Lecanopsis turcica (Bodenheimer, 1951)	Previously recorded as *L. porifera* Borchsenius, 1952
Luzulaspis kosztarabi Koteja & Kozár, 1979	
Luzulaspis nemorosa Koteja, 1966	Previously recorded as *L. luzulae* (Dufour, 1864).
Luzulaspis rajae Kozár, 1981	
Luzulaspis scotica Green, 1926	Previously recorded as *L. borchsenii* Rehacek 1959.
Palaeolecanium bituberculatum (Targioni Tozzetti, 1868)	
Parafairmairia bipartita (Signoret, 1872)	
Parafairmairia gracilis Green, 1916	
Parthenolecanium corni (Bouché, 1844)	
Parthenolecanium fletcheri (Cockerell, 1893)	
Parthenolecanium persicae (Fabricius, 1776)	
Parthenolecanium pomeranicum (Kawecki, 1954)	
Parthenolecanium rufulum (Cockerell, 1903)	
Phyllostroma myrtilli (Kaltenbach, 1874).	The occurrence of this species in Hungary was mentioned by Lindinger (1912). No voucher specimen in Kozár's collection.
Physokermes hemicryphus (Dalman, 1826)	
Physokermes inopinatus Danzig & Kozár, 1973	
Physokermes piceae (Schrank, 1801)	
Poaspis intermedia (Goux, 1939)	Previously recorded as *Luzulaspis.*
Poaspis jahandiezi (Balachowsky, 1932)	Previously recorded as *Luzulaspis.*
Poaspis lata (Goux, 1939)	
Psilococcus ruber Borchsenius, 1952	
Pulvinaria ribesiae Signoret, 1873	
Pulvinaria vitis (Linnaeus, 1758)	Previously recorded as *P. betulae* (Linnaeus, 1758).
Pulvinariella mesembryanthemi (Vallot, 1830)	It has not been found since its first record (Kozár 2005), and has probably disappeared.
Rhizopulvinaria artemisiae (Signoret, 1873)	
Rhizopulvinaria gracilis Canard, 1967	
Rhizopulvinaria spinifera Borchsenius, 1952	
Rhodococcus perornatus (Cockerell & Parrott, 1899)	Previously recorded as *R. bulgariensis* (Wünn, 1939) or *R. rosophilus* Borchsenius, 1953.
Rhodococcus spireae (Borchsenius, 1949)	
Saissetia coffeae (Walker, 1852)	Previously recorded as *S. hemisphaerica* (Targioni Tozzetti, 1867).
Saissetia oleae (Olivier, 1791)	
Scythia craniumequinum Kiritchenko, 1938	
Scythia festuceti (Šulc, 1941)	
Sphaerolecanium prunastri (Fonscolombe, 1834)	
Vittacoccus longicornis (Green, 1916)	
Cryptococcidae (2 genera)	
Cryptococcus aceris Borchsenius, 1937	
Cryptococcus fagisuga, Lindinger, 1912	
Pseudochermes fraxini (Kaltenbach, 1860)	
Diaspididae (27 genera)	
Abgrallaspis cyanophylli (Signoret, 1869)	Found in 2013 by K. Fetykó on *Globularia punctata* outdoors in Hungary (Budapest, Sashegy). Overwintering method unknown.
Aonidia lauri (Bouché, 1833)	
Acanthomytilus jablonowskii Kozár & Matile-Ferrero, 1983	

Taxon	Comment
Aonidiella aurantii (Maskell, 1879)	
Aspidiotus nerii Bouché, 1833	Previously recorded as *A. hederae* Signoret, 1869.
Aspidiotus destructor Signoret, 1869	New to the Hungarian fauna. Found in 2013 by K. Fetykó on *Phoenix roubellini* indoors in Hungary (Kecskemét).
Aulacaspis rosae (Bouché, 1833)	
Aulacaspis yatsumatsui Takagi, 1977	New to the Hungarian fauna. Found in 2012 by K. Fetykó on *Cycas revoluta* indoors in Hungary (Kecskemét).
Carulaspis carueli (Signoret, 1869)	New to the Hungarian fauna. Found in 2009-2012 by F. Kozár indoors and outdoors in Hungary (Csepel, Nagykovácsi, Solymár, Zalakomár), on nursery plants (*Thuja* sp., *Chamaecyparis* sp., *Juniperus* sp.).
Carulaspis juniperi (Bouché, 1851)	In high densities on ornamental plants in recent years.
Carulaspis visci (Schrank, 1781)	According to Kosztarab (1955) the first record of the species in Hungary was in 1950. No voucher specimen in Kozár's collection.
Chionaspis austriaca Lindinger, 1912	According to Kosztarab (1955) the first record of the species in Hungary was in 1938. No voucher specimen in Kozár's collection.
Chionaspis lepineyi Balachowsky, 1928	
Chionaspis salicis (Linnaeus, 1958)	
Chortinaspis subterraneus (Lindinger, 1912)	
Chrysomphalus aonidum (Linnaeus, 1758)	Previously recorded as *C. ficus* Ashmead, 1880.
Chrysomphalus dictyospermi (Morgan, 1889)	
Diaspidiotus alni (Marchal, 1909)	
Diaspidiotus bavaricus (Lindinger, 1912)	
Diaspidiotus gigas (Thiem & Gerneck, 1934)	Previously recorded as *Quadraspidiotus.*
Diaspidiotus labiatarum (Marchal, 1909)	Previously recorded as *Quadraspidiotus.*
Diaspidiotus lenticularis (Lindinger, 1912)	Previously recorded as *Quadraspidiotus.*
Diaspidiotus marani Zahradnik, 1952	Previously recorded as *Quadraspidiotus.*
Diaspidiotus ostreaeformis (Curtis, 1843)	Previously recorded as *Quadraspidiotus.*
Diaspidiotus perniciosus (Comstock, 1881)	Previously recorded as *Quadraspidiotus.*
Diaspidiotus pyri (Lichtenstein, 1881)	Previously recorded as *Quadraspidiotus.*
Diaspidiotus sulci Balachowsky, 1950	Previously recorded as *Quadraspidiotus.*
Diaspidiotus wuenni (Lindinger, 1923)	
Diaspidiotus zonatus (Frauenfeld, 1868)	Previously recorded as *Quadraspidiotus*; *Diaspidiotus hungaricus* Kosztarab, 1956 is a synonym.
Diaspis bouisduvali Signoret, 1869	New to the Hungarian fauna. Found in 2006 by É. Szita on *Ananas* sp. indoors in Hungary (Budapest).
Diaspis bromeliae (Kerner, 1778)	
Diaspis echinocacti (Bouché, 1833)	
Dynaspidiotus abietis (Schrank, 1776)	Previously recorded as *Nuculaspis.*
Dynaspidiotus britannicus (Newstead, 1896)	
Epidiaspis leperii (Signoret, 1869)	
Ferreroaspis hungaricus (Vinis, 1981)	Previously recorded as *Acanthomytilus*
Hemiberlesia rapax (Comstock, 1881)	
Lepidosaphes beckii (Newman, 1869).	Often in high densities on imported lemon and orange fruit.
Lepidosaphes conchiformis (Gmelin, 1789)	Previously recorded as *Mytilaspis rubri* Thiem, 1931.

Taxon	**Comment**
Lepidosaphes gloverii (Packard, 1869)	
Lepidosaphes granati Koroneos, 1934	Previously recorded as *Mytilococcus.*
Lepidosaphes newsteadi (Šulc, 1895)	
Lepidosaphes ulmi (Linnaeus, 1758)	The validity of the synonyms *L. tiliae* Savescu, 1957 and *L. populi* Savescu, 1957 and/or their presence in Hungary is questionable.
Leucaspis loewi Colvée, 1882	Previously recorded as *Anamaspis*. In very high densities in recent years (Kozár et al. 2012).
Leucaspis pini (Hartig, 1839).	In very high densities in recent years (Kozár et al. 2012).
Leucaspis pusilla Löw, 1883.	In very high densities in recent years (Kozár et al. 2012).
Mohelnaspis massiliensis (Goux, 1937)	
Mycetaspis personata (Comstock, 1883)	
Parlatoria crotonis Douglas, 1887	
Parlatoria pergandii Comstock, 1881	
Parlatoria ziziphi (Lucas, 1853)	
Pinnaspis aspidistrae (Signoret, 1869)	
Pinnaspis strachani (Cooley, 1899)	
Pseudaulacaspis pentagona (Targioni Tozzetti, 1886)	Important outdoor pest of fruit and and ornamental plantss in Hungary; found in 2012 by K. Fetykó on kiwi fruit imported from Greece.
Rhizaspidiotus balachowskyi Kozár & Matile-Ferrero, 1983	
Syngenaspis parlatoriae Šulc, 1895	Placed by some authors in *Parlatoria.*
Targionia vitis (Signoret, 1876)	
Unaspis euonymi (Comstock, 1881)	A very important pest of *Euonymus* in towns in recent years.
Unaspis yanonensis (Kuwana, 1923)	New to the Hungarian fauna. Found in 2013 in Hungary (Budapest) indoors.
Eriococcidae (8 genera)	
Acanthococcus aceris Signoret, 1875	
Acanthococcus melnikensis Hodgson & Trencheva, 2008	New to the Hungarian fauna. Found in 1969 in Hungary (Vászoly) by F. Kozár on *Quercus* sp.
Acanthococcus roboris (Goux, 1931)	
Acanthococcus thymi (Schrank, 1801)	
Anophococcus agropyri Borchsenius, 1949	Previously recorded as *Acanthococcus* or *Rhizococcus.*
Anophococcus cingulatus (Kiritchenko, 1940)	Previously recorded as *Acanthococcus* or *Rhizococcus.*
Anophococcus cynodontis (Kiritchenko, 1940)	Previously recorded as *Acanthococcus* or *Rhizococcus.*
Anophococcus granulatus (Green, 1931)	New to the Hungarian fauna. Found in 2007 in Hungary (Vászoly) by F. Kozár on Poaceae.
Anophococcus herbaceus Danzig, 1962	Previously recorded as *Acanthococcus* or *Rhizococcus.*
Anophococcus insignis (Newstead, 1891)	Previously recorded as *Acanthococcus* or *Rhizococcus.*
Anophococcus species nova Kozár & Konczné Benedicty, 2013	Previously recorded as *Rhizococcus cistacearum* (Goux, 1936), a misidentification of *A.* sp. n.). New to the Hungarian fauna. Found in 2008 in Hungary (Fehérszék) by G. Konz on *Festuca* sp.
Anophococcus pseudinsignis (Green, 1921)	Previously recorded as *Acanthococcus* or *Rhizococcus.*

Taxon	Comment
Gossyparia spuria (Modeer, 1778)	
Greenisca brachypodii Borchsenius & Danzig, 1966	
Greenisca gouxi (Balachowsky, 1954)	
Gregoporia erwini Kozár, 1996	Previously recorded as *Greenisca*.
Kaweckia glyceriae (Green, 1921)	Previously recorded as *Greenisca.*
Kaweckia laeticoris (Tereznikova, 1965)	Previously recorded as *Greenisca.*
Ovaticoccus agavium (Douglas, 1888)	
Rhizococcus artiguesi Goux, 1991	New to the Hungarian fauna. Found in 2011 in Hungary (Budaörs) by F. Kozár on *Thymus glabrescens*.
Rhizococcus baldonensis Rasina, 1966	
Rhizococcus cantium (Williams, 1985)	Previously recorded as *Acanthococcus*.
Rhizococcus echinatus (Goux, 1936)	New to the Hungarian fauna. Found by D-vac method in 1982 in Hungary (Sashegy) by A. Rákóczi, on *Festucetum*.
Rhizococcus desertus Matesova, 1957	Previously recorded as *Acanthococcus*.
Rhizococcus devoniensis (Green, 1896)	Previously recorded as *Acanthococcus*.
Rhizococcus gnidii Silvestri, 1875	New to the Hungarian fauna. Found in 1981 in Hungary (Budaörs) by F. Kozár on *Thymus glabrescens.*
Rhizococcus greeni (Newstead, 1898)	
Rhizococcus istresianus (Goux, 1989)	New to the Hungarian fauna. Found in 2007 in Hungary (Török) by F. Kozár on *Hieracium* sp.
Rhizococcus micracanthus Danzig, 1975	Previously recorded as *Acanthococcus*.
Rhizococcus munroi Boratynski, 1962	Previously recorded as *Acanthococcus*.
Rhizococcus reynei (Schmutterer, 1952)	Previously recorded as *Acanthococcus*.
Rhizococcus targassoniensis (Goux, 1993)	New to the Hungarian fauna. Found in 2008 in Hungary (Bócsa) by Z. Konczné Benedicty on *Artemisia* sp.
Rhizococcus zernae (Tereznikova, 1977)	New to the Hungarian fauna.
Kermesidae (1 genus)	
Kermes bacciformis Leonardi, 1908	
Kermes gibbosus Signoret, 1875	
Kermes quercus (Linnaeus, 1758)	
Kermes roboris (Fourcroy, 1785)	
Margarodidae (5 genera)	
Dimargarodes mediterraneus Silvestri, 1906	
Icerya purchasi (Maskell, 1878)	
Matsucoccus pini (Green, 1925)	Previously recorded as *M. matsumurae* (Kuwana, 1905).
Neomargarodes festucae Archangelskaja, 1935	
Porphyrophora polonica (Linnaeus, 1758)	
Ortheziidae (4 genera)	
Insignorthezia insignis (Browne, 1887)	Previously recorded as *Orthezia.*
Newsteadia floccosa (De Geer, 1778)	
Orthezia arenariae Vayssiere, 1923	
Orthezia urticae (Linnaeus, 1758)	
Orthezia yashusi Kuwana, 0923	
Ortheziola britannica Kozár & Miller, 2000	
Ortheziola vejdovskyi Šulc, 1895	
Pseudococcidae (35 genera)	
Atrococcus achilleae (Kiritchenko, 1936)	
Atrococcus arakelianae (Ter-Grigorjan, 1964)	
Atrococcus bejbienkoi Kozár & Danzig, 1976	
Atrococcus cracens Williams, 1962	
Atrococcus paludinus (Green, 1921)	
Balanococcus boratynskii Williams, 1962	

Taxon	**Comment**
Balanococcus singularis Schmutterer, 1952	Previously recorded as *Trionymus.*
Boreococcus ingricus Danzig, 1960	
Brevennia pulveraria (Newstead, 1892)	
Ceroputo pilosellae (Šulc, 1898)	Previously recorded as *Puto.*
Chaetococcus phragmitis (Marchal, 1909)	
Chaetococcus sulci (Green, 1934)	
Chnaurococcus danzigae Kozár & Kosztarab, 1976	
Chorizococcus rostrellum (Lobdell, 1930)	
Chorizococcus senarius McKenzie, 1967	Previously this species was known only from USA (California) (Ben-Dov et al. 2013). It was found in Hungary (Töreki) at a highway rest area on *Cynodon dactylon*. The mealybug could have be introduced on transported plant material.
Coccidohystrix samui Kozár & Benedicty, 1997)	
Coccura comari (Künow, 1880)	
Dysmicoccus brevipes (Newstead, 1891)	
Dysmicoccus walkeri (Newstead, 1891)	
Fonscolombia europeae (Newstead, 1897)	
Fonscolombia graminis Lichtenstein, 1877	
Fonscolombia tomlini (Newstead, 1892)	Previously recorded as *Phenacoccopsis.*
Geococcus coffeae Green, 1933	
Heliococcus bohemicus Šulc, 1912	
Heliococcus danzigae Bazarov, 1974	
Heliococcus glacialis (Newstead, 1900)	Previously recorded as *H. cydoniae* Borchsenius, 1937.
Heliococcus radicicola Goux, 1934	
Heliococcus salviae Borchsenius, 1949	
Heliococcus sulci Goux, 1934	
Heterococcus agropyri Savescu, 1985	Proposed as a synonym of *H. nudus* (Green, 1926).
Heterococcus nudus (Green, 1926)	
Heterococcus tritici (Kiritchenko, 1932)	
Kissrhizoecus hungaricus Kozár & Konczné Benedicty, 2004	An element from the steppes, origin unknown.
Longicoccus ashtarakensis Ter-Grigorjan, 1964	New to the Hungarian fauna. Found in 2004 in Hungary (Orgovány) by F. Kozár and Z. Konczné Benedicty, on *Festuca* sp. Probably native.
Longicoccus festucae (Koteja, 1971)	
Longicoccus psammophilus (Koteja, 1971)	
Metadenopus festucae Šulc, 1933	
Mirococcopsis avetianae Ter-Grigorian, 1964	
Mirococcopsis borchsenii (Ter-Grigorian, 1964)	Previously recorded as *Eumirococcus.*
Mirococcopsis elongatus Borchsenius, 1948	
Mirococcopsis nagyi Kozár, 1981	
Mirococcopsis subterraneus (Newstead, 1893)	Previously recorded as *Chnaurococcus.*
Nipaecoccus nipae (Maskell, 1892)	
Peliococcus balteatus (Green, 1928)	
Peliococcus chersonensis (Kiritchenko, 1935)	
Peliococcus marrubii (Kiritchenko, 1935)	Previously recorded as *Spinococcus.*
Peliococcus rosae Danzig, 2001	Previously recorded as *Spinococcus morrisoni* Kiritchenko, 1935.
Peliococcus turanicus (Kiritchenko, 1931)	
Pelizzaricoccus gabrielis Kozár, 1991	New to theHungarian fauna. Found in 2005 by D-vac in Hungary (Nagykovácsi), by F. Samu and E. Botos. Origin unknown.
Phenacoccus abditus Borchsenius, 1949	

Taxon	Comment
Phenacoccus aceris (Signoret, 1875)	Previously recorded by the synonym *Phenacoccus mespili* (Signoret, 1875). No voucher specimens available.
Phenacoccus avenae Borchsenius, 1949	
Phenacoccus bicerarius Borchsenius, 1949	
Phenacoccus evelinae (Tereznikova, 1975)	Previously recorded as *Paroudablis graminis* Tereznikova, 1968.
Phenacoccus ferulae Borchsenius, 1949	
Phenacoccus hordei (Lindeman, 1886)	
Phenacoccus interruptus Green, 1923	Previously recorded as *Paroudablis.*
Phenacoccus persimplex Borchsenius, 1949	
Phenacoccus phenacoccoides (Kiritchenko, 1932)	
Phenacoccus piceae Löw, 1883	Previously recorded as *Paroudablis.*
Phenacoccus pumilus Kiritchenko, 1935	
Planococcus citri (Risso, 1813)	In high densities in greenhouses and buildings; males were caught by pheromone traps in Central Europe.
Planococcus vovae (Nassonov, 1908)	Previously recorded as *Allococcus*. In high densities in recent years on *Thuja* sp., *Juniperus* sp., and *Chamaecyparis* sp. (Fetykó 2010).
Polystomophora ostiaplurima (Kiritchenko, 1940)	
Pseudococcus elisae Borchsenius, 1947	New to the Hungarian fauna. Found in 2007 in Hungary (Gyál) by K. Fürst on *Musa* sp. fruits. Unknown origin.
Pseudococcus longispinus (Targioni Tozzetti, 1868)	Previously recorded as *P. adonidum.*
Pseudococcus microadonidum Beardsley, 1966	
Pseudococcus viburni (Signoret, 1875)	Previously recorded as *P. affinis* (Maskell, 1894), *P. obscurus* Essig, 1909, or *P. maritimus* Ehrhorn, 1900).
Puto superbus (Leonardi, 1907)	Previously recorded as *Macrocerococcus.*
Rhizoecus albidus Goux, 1936)	
Rhizoecus cacticans (Hambleton, 1946)	
Rhizoecus falcifer Künckel d'Herculais, 1878	
Rhizoecus franconiae Schmutterer, 1956	
Rhizoecus kazahstanus Matesova, 1980	
Rhodania porifera Goux, 1935	
Ripersiella caesii Schmutterer, 1956	New to the Hungarian fauna. Found in 2007 in Hungary (Sárbogárd) by B. Kiss on *Festuca* sp. Probably native. Previously recorded as *Rhizoecus*.
Ripersiella halophila (Hardy, 1868)	Previously recorded as *Rhizoecus*.
Ripersiella lelloi (Mazzeo, 1995)	
Ripersiella periolana (Goux, 1985)	Previously recorded as *R. halophilus.*
Ripersiella poltavae Laing, 1929	Previously recorded as *Rhizoecus.*
Ritsemia pupifera Lichtenstein, 1879	
Spilococcus artemisiphilus Tang, 1988	New to the Hungarian fauna. Found in 2009 in Hungary (Csepel) by F. Kozár and É. Szita on *Lotus corniculatus*. Probably native.
Spilococcus furcatissispinus (Borchsenius, 1937)	New to the Hungarian fauna. Found in 2009 in Hungary (Lajosmizse) by F. Kozár on *Festuca* sp. Probably native.
Spilococcus halli (McKenzie & Williams, 1965)	Previously recorded as *Chorizococcus viktorina.*
Spilococcus mamillariae (Bouché, 1844)	Previously recorded as *S. cactearum.*
Trionymus aberrans Goux, 1938	
Trionymus dactylis Green, 1925	
Trionymus elymi (Borchsenius, 1949)	

Taxon	**Comment**
Trionymus graminellus Borchsenius, 1949	New to the Hungarian fauna. Found in 2010 in Hungary (Törökbálint) by F. Kozár on *Festuca* sp. Probable native.
Trionymus hamberdi (Borchsenius, 1949)	
Trionymus multivorus (Kiritchenko, 1935)	
Trionymus newsteadi (Green, 1917)	
Trionymus perrisii (Signoret, 1875)	
Trionymus phalaridis Green, 1925	
Trionymus radicum (Newstead, 1895)	
Trionymus singularis Schmutterer, 1952	New to the Hungarian fauna. Found in Hungary (Gyál) by F. Kozár on *Agropyron sp*. Probably native.
Trionymus thulensis Green, 1931	
Trionymus tomlini Green, 1925	
Volvicoccus stipae Borchsenius, 1949	Previously recorded as *Mirococcopsis.*
Volvicoccus volvifer (Goux, 1945)	New to the Hungarian fauna. Found in Hungary (Sashegy) by D-vac (leg: E. Botos) on *Brometum*. Probably native.
Vryburgia brevicruris (McKenzie, 1960)	

Comments:

i. The record of the presence of *Acanthomytilus sacchari* (Hall, 1923) in Hungary was given by Danzig and Pellizzari in Kozár (ed.) (1998), cited by ScaleNet, is not proven.

ii. The presence of *Lepidosaphes shanxiensis* Shi, 1990 in Hungary, cited by ScaleNet, is not proven (error or misidentification).

iii. The record of the presence of *Parlatoria oleae* (Colvée, 1880) in Hungary given by Kosztarab and Kozár (1988), based on US quarantine record cited by ScaleNet, is not proven.

iv. The record of *Kermes ilicis* (Linnaeus, 1758) given by Sugonyaev (1965) as a host of a parasitoid, cited by ScaleNet as a scale distribution record, is a misunderstanding of the text; the distribution record concerns the parasitoid species, not the scale.

v. The record of the presence of *Luzulaspis frontalis* Green, 1928, cited by ScaleNet as a scale distribution record for Hungary, is probably a misunderstanding of the text of Kosztarab and Kozár (1978), where it was mentioned as possibly present in Hungary.

106 (38.69%) species are considered as widely distributed Pan-Palaearctic species, 75 (27.37%) are widely distributed Euro-Siberian species, 91 (33.21%) are cosmopolitan, and only two species are known to originate from the Mediterranean subregion.

Our data from Hungary shows a substantially different picture from that of earlier analyses dealing with scale insect zoogeography (Danzig 1980; Kozár 1995; Kozár and Drozdják 1986), where most of the species were thought to be restricted to one of the special subregions of the Palaearctic Region. The high proportion of the Palaearctic and cosmopolitan species in our analysis shows some similarity with the fauna of Israel (Ben-Dov 2012). This may be explained by the special borderline situation of each of these countries. Both are situated on the borders between different zoogeographic regions: Hungary on the borders of the European-Siberian and Mediterranean subregions, with strong influence from Irano-Turanian subregions; while Israel is on the borders of the Palaearctic, Oriental and the Ethiopian regions. Hungary has a tem-

perate climate, but with several submediterranean, xerophilous habitats. In addition, the Great Hungarian Plain belongs to the steppic province of the Palaearctic Region, which ranges from Hungary to China and the Far East (Emeljanov 1974). The importance of the steppic influence can be seen in that almost 50% of the species belong to the families Pseudococcidae and Eriococcidae, and most of them live on grasses and small herbaceous plants (Table 3).

In Central Europe in the wide bio-geographic sense of Emeljanov (1974), the Hungarian list of 274 species (Fig. 1) represents the greatest species-richness value among the component countries. Undoubtedly this is partly due to better exploration of Hungary. However, it is also due to the various climatic influences affecting the territory from different directions. Important differences in species richness values were found between the data on ScaleNet and the local checklists (Fetykó et al. 2010; Foldi 2001; Gertsson 2001; Jansen 1999; Kozár 2005; Kozár et al. 1994; Kozár et al. in preparation; Lagowska 2001; Masten-Milek and Simala 2008; Pellizzari and Russo 2004; Schmutterer 2008; Seljak 2010; Tereznikova 1975; 1981; 1986, Tomov et al. 2009; Trencheva 2012). The map shows that some countries, like Bosnia and Serbia, are inadequately represented in the ScaleNet database. The published check lists in general show a more reliable picture; however, in some cases we meet an opposite situation (for example, for Germany and France). These discrepancies need further study in the future.

Concerning the category of species found indoors in greenhouses and buildings (Table 4) detailed information on these species are available in Kosztarab and Kozár (1978; 1988), in Kozár (1989; 1998; 2005) and on ScaleNet. Four species in this category are new records for the Hungarian fauna. (*Diaspis bouisduvali* Signoret, 1869 *Unaspis yanonensis* (Kuwana, 1923), *Aspidiotus destructor* Signoret, 1869, *Aulacaspis yatsumatsui* Takagi, 1977). The following species have become significant pests in Hungary in recent years: *Aspidiotus nerii* Bouché, 1833; *Coccus hesperidum* Linnaeus, 1758; *Planococcus citri* (Risso, 1813); *Pseudococcus longispinus* (Targioni Tozzetti, 1868); *Pseudococcus viburni* (Signoret, 1875) and *Saissetia coffeae* (Walker, 1852) (Kozár 1989).

A detailed study of the scale insects introduced into Hungary on tropical and subtropical fruits was published by Kozár and Kienitz (1979), whose list already contained 13 species shown in Table 5, only one species in this category is new record for the Hungarian fauna (*Pseudococcus elisae* Borchsenius, 1957). The number of species in this category is surprisingly low, compared to the number of pests living on various fruits exported from the different regions of production. The low species number reflects the efforts made by exporting countries to prevent the spread of invasive pests. It should be noted that most of these species were unable to establish in Hungary even indoors in greenhouses or on ornamental plants in buildings, despite repeated introductions over more than one hundred years. On the other hand, some of them have become regular pests in Hungary, which has lead to some overlap with the category in Table 4. Among these species, *A. nerii*, *Pl. citri* and *Ps. viburni* occur in greenhouses and buildings, while *P. pentagona* and *C. carueli* are found outdoors.

Table 3. Number of scale insect species in Hungary, by family

Family	Number of species	% of the Hungarian fauna	Number of new records
Asterolecaniidae	7	2.55	0
Cerococcidae	1	0.36	0
Coccidae	54	19.71	0
Cryptococcidae	3	1.09	0
Diaspididae	59	21.53	5
Eriococcidae	33	12.04	9
Kermesidae	4	1.46	0
Margarodidae s.l.	5	11.82	0
Ortheziidae	7	2.55	0
Pseudococcidae	101	36.86	8

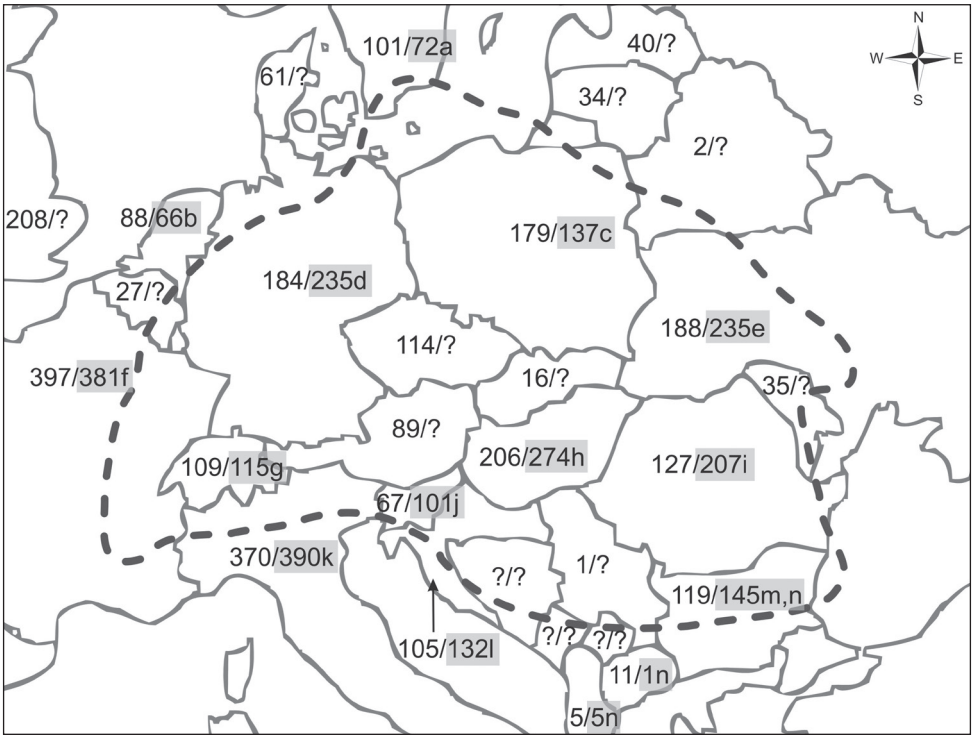

Figure 1. Biogeographic map of Central Europe after Emeljavon (1974) in the wider sense, with scale insect species numbers. In each country, the first number represents the number of scale insect species from ScaleNet database (Ben-Dov et al. 2013); the second number, if present, shows the number of species recorded in the following published check lists: (a) Gertsson 2001; (b) Jansen 1999; (c) Lagowska 2001; (d) Schmutterer 2008; (e) Tereznikova 1975; 1981; 1986; (f) Foldi 2001; (g) Kozár et al. 1994; (i) Fetykó et al. 2010; (j) Seljak 2010; (k) Pellizzari and Russo 2004; (l) Masten-Milek and Simala 2008; (m) Trecheva et al. 2012; (n) Tomov et al. 2009 and the present work for Hungary (h).

Table 4. List of scale insect species found indoors in greenhouses and buildings (on ornamental plants) in Hungary

Abgrallaspis cyanophylli (Signoret, 1869)
Aonidia lauri (Bouché, 1833)
Aspidiotus nerii Bouché, 1833
Aspidiotus destructor Signoret, 1869.
Asteroleanium epidendri (Bouché, 1844)
Aulacaspis yatsumatsui Takagi, 1977
Ceroplastes japonicus Green, 1921
Ceroplastes rubens Maskell, 1893
Ceroplastes rusci (Linnaeus, 1758)
Chrysomphalus aonidum (Linnaeus, 1758)
Chrysomphalus dictyospermi (Morgan, 1889)
Coccus hesperidum Linnaeus, 1758
Diaspis bouisduvali Signoret, 1869
Diaspis bromeliae (Kerner, 1778)
Diaspis echinocacti (Bouché, 1833)
Dynaspidiotus britannicus (Newstead, 1896)
Etiennea villiersi Matile-Ferrero, 1984
Eucalymnatus tessellatus (Signoret, 1873)
Gascardia hodgsoni Matile-Ferrero & Le Ruyet, 1985
Geococcus coffeae Green, 1933
Hemiberlesia rapax (Comstock, 1881)
Icerya purchasi (Maskell, 1878)
Mycetaspis personata (Comstock, 1883)
Nipaecoccus nipae (Maskell, 1892)
Prelongorthezia insignis Browne, 1887
Ovaticoccus agavium (Douglas, 1888)
Parlatoria crotonis Douglas, 1887
Pinnaspis aspidistrae (Signoret, 1869)
Pinnaspis strachani (Cooley, 1899)
Planococcus citri (Risso, 1813)
Pseudococcus longispinus (Targioni Tozzetti, 1868)
Pseudococcus microadonidum Beardsley, 1966
Pseudococcus viburni (Signoret, 1875)
Pulvinariella mesembryanthemi (Vallot, 1830)
Rhizoecus cacticans (Hambleton, 1946)
Rhizoecus falcifer Künckel d'Herculais, 1878
Saissetia coffeae (Walker, 1852)
Saissetia oleae (Olivier, 1791)
Spilococcus mamillariae (Bouché, 1844)
Unaspis yanonensis (Kuwana, 1923)
Vryburgia brevicruris (McKenzie, 1960)

Table 5. Scale insect species found in Hungary on imported (mainly subtropical and tropical) fruits for consumption.

Aonidiella aurantii (Maskell, 1879)
Aspidiotus nerii Bouché, 1833
Carulaspis caruelii (Signoret, 1869)
Chrysomphalus aonidum (Linnaeus, 1758)
Chrysomphalus dictyospermi (Morgan, 1889)
Dysmicoccus brevipes (Newstead, 1891)
Lepidosaphes beckii (Newman, 1869)
Lepidosaphes gloverii (Packard, 1869)
Parlatoria pergandii Comstock, 1881
Parlatoria ziziphi (Lucas, 1853)
Planococcus citri (Risso, 1813)
Pseudaulacaspis pentagona (Targioni Tozzetti, 1886)
Pseudococcus elisae Borchsenius, 1957
Pseudococcus viburni (Signoret, 1875)

Acknowledgements

Our thanks are due to numerous colleagues who collected scale insects for us, particularly Dr. Barnabás Nagy, Dr. Ferenc Szentkirályi, Dr. Klára Reiderné Saly, Dr. Géza Ripka, Dr. György Csóka, and Zoltán Avar. We also thank Dr. Bora Kaydan (Cukorova University, Department of Plant Protection, Adana, Turkey) and Dr Gillian W. Watson (California Department of Food & Agriculture, Sacramento, California, U.S.A.) for helpful suggestions on the manuscript. Our work was financially supported by various grants from the Hungarian National Research Found (OTKA: K75889, K83829, K81971, K91104).

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ZooKeys 309: 67–69 (2013)
doi: 10.3897/zookeys.309.5183
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Two new replacement names for the planthopper genera in Dictyopharidae (Hemiptera, Fulgoromorpha)

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Academic editor: *Mike Wilson* | Received 21 March 2013 | Accepted 7 June 2013 | Published 14 June 2013

Citation: Xing J, Chen X (2013) Two new replacement names for the planthopper genera in Dictyopharidae (Hemiptera, Fulgoromorpha). ZooKeys 309: 66–69. doi: 10.3897/zookeys.309.5183

Abstract

New replacement names are proposed for two genera of the family Dictyopharidae (Hemiptera: Fulgoromorpha). The following changes are proposed: *Neonotostrophia* **nom. n.** for *Notostrophia* Emeljanov (not Waterhouse); *Emeljanovina* **nom. n.** for *Glochina* Emeljanov (not Meigen); *Neonotostrophia nigrosuturalis* (Melichar, 1912) **comb. n.** from *Notostrophia nigrosuturalis* (Melichar, 1912) = *Dictyophara nigrosuturalis* Melichar, 1912 and *Emeljanovina dixoni* (Distant, 1906) **comb. n.** from *Glochina dixoni* (Distant, 1906) = *Dictyophara dixoni* Distant, 1906.

Keywords

Homoptera, Dictyopharidae, planthopper, homonym, replacement name

Introduction

The purpose of the present paper is to bring the taxonomy of planthoppers into accordance with the International Code of Zoological Nomenclature (1999). Two homonyms were discovered for genera names in Dictyopharidae (Hemiptera: Fulgoromorpha). In an effort to reduce homonyms in Fulgoromorpha, we propose two replacement names for these genera.

Nomenclatural changes and notes

Genus *Neonotostrophia* nom. n.

Notostrophia Emeljanov, 2011: 305 (Insecta: Hemiptera: Fulgoroidea: Dictyopharidae). Preoccupied by Waterhouse, 1973: 35 (Brachiopoda: Strophomenata: Orthotetida: Schuchertellidae).

Type species. *Dictyophara nigrosuturalis* Melichar, 1912.

Remarks on nomenclatural change. Emeljanov (2011) established the planthopper genus *Notostrophia* with the type species *Dictyophara nigrosuturalis* Melichar, 1912. So far, this genus includes only the type species. This genus is used as a valid generic name in Dictyopharidae. Unfortunately, the name *Notostrophia* Emeljanov (2011) was preoccupied by *Notostrophia* Waterhouse (1973), a genus of Schuchertellidae (Brachiopoda: Strophomenata: Orthotetida) based on type species *Notostrophia homeri* Waterhouse, 1973. Thus, the planthopper genus *Notostrophia* Emeljanov, 2011 is a junior homonym of the genus *Notostrophia* Waterhouse, 1973. According to Article 60 of the International Code of Zoological Nomenclature, we propose a new replacement name *Neonotostrophia* nom. n. for *Notostrophia* Emeljanov, 2011.

Etymology. From the preexisting name *Notostrophia*, the prefix "Neo-" from the Greek "*neos*" meaning new; gender feminine.

Summary of nomenclatural changes. *Neonotostrophia* new replacement name = *Notostrophia* Emeljanov, 2011 (nec Waterhouse, 1973)

Neonotostrophia nigrosuturalis (Melichar, 1912) comb. n. = *Notostrophia nigrosuturalis* (Melichar, 1912) = *Dictyophara nigrosuturalis* Melichar, 1912

Genus *Emeljanovina* nom. n.

Glochina Emeljanov, 2011: 320 (Hemiptera: Fulgoroidea: Dictyopharidae). Preoccupied by Meigen, 1830: 280 (Diptera: Tipuloidea: Limoniidae).

Type species. *Dictyophara dixoni* Distant, 1906.

Remarks on nomenclatural change. Emeljanov (2011) established the planthopper genus *Glochina* with the type species *Dictyophara dixoni* Distant, 1906. So far, this genus includes only type species. It is used as a valid generic name. Unfortunately, the name *Glochina* Emeljanov (2011) was preoccupied by *Glochina* Meigen (1830), a subgenus *Dicranomyia (Glochina)* Meigen, 1830 in Limoniidae (Diptera: Tipuloidea) based on type species *Glochina sericata* Meigen, 1830. Thus, the genus *Glochina* Emeljanov, 2011 is a junior homonym of the subgenus *Dicranomyia (Glochina)* Meigen, 1830. According to Article 60 of the International Code of Zoological Nomenclature, we propose a new replacement name *Emeljanovina* nom. n. for *Glochina* Emeljanov, 2011.

Etymology. The genus from A. F. Emeljanov who is the author of the preexisting *Glochina*; gender feminine.

Summary of nomenclatural changes. *Emeljanovina* new replacement name = *Glochina* Emeljanov, 2011 (nec Meigen, 1830) *Emeljanovina dixoni* (Distant, 1906) comb. n. = *Glochina dixoni* (Distant, 1906) = *Dictyophara dixoni* Distant, 1906.

Acknowledgments

We are grateful to Prof. Ai-Ping Liang (Institute of Zoology, Chinese Academy of Sciences, Beijing, China) and two anonymous referees for reading the manuscript and making some suggestions. This work was supported by the National Natural Science Foundation of China (31060290, 31093430, 31160163) and the International Science and Technology Cooperation Program of Guizhou (Grant no. 20107005).

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ZooKeys 309: 71–73 (2013)
doi: 10.3897/zookeys.309.5532
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Disregarding ZooBank registration results in the unavailability of *Hemicaloosia graminis* Zeng et al., 2012 (Nematoda, Tylenchida) under the ICZN Code

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Academic editor: *Lyubomir Penev* | Received 16 May 2013 | Accepted 10 June 2013 | Published 14 June 2013

Citation: Inserra RN, Stanley JD, Troccoli A, Chitambar J, Subbotin SA (2013) Disregarding ZooBank registration results in the unavailability of *Hemicaloosia graminis* Zeng et al., 2012 (Nematoda, Tylenchida) under the ICZN Code. ZooKeys 309: 71–73. doi: 10.3897/zookeys.309.5532

In September 2012, an Amendment of Articles 8, 9, 10, 21 and 78 of the International Code of Zoological Nomenclature (ICZN) was published in order to expand and refine methods of publication allowed by the Code, particularly in reference to electronic publications (International Commission on Zoological Nomenclature 2012). The amended Article 8.5.3 states that: "In order for an electronic-published work to be available, it must be registered in the Official Register of Zoological Nomenclature (ZooBank)….. and contain evidence in the work that such registration has occurred." The requirements for electronic publications also include: clear evidence in the work of the date of publication (Article 8.5.2.) with proof of the occurred registration in ZooBank. The registration in ZooBank is not required for works published in printed journals.

In 2011–2012, R.N. Inserra, J.D. Stanley, A. Troccoli, J. Chitambar and S.A. Subbotin characterized morphologically and molecularly three populations (a total of 42 females and 37 males) of a plant parasitic nematode of the genus *Hemicaloosia* (Hemicycliophoridae) from Florida, and described them as a new species named *H. vagisclera*. The description of this new *Hemicaloosia* was received for publication on

5th March 2012 and published in a preliminary on-line version of *Nematology* on 27th April 2012. This work was not registered in ZooBank because *Nematology* is published as both electronic and printed versions. The paper was published subsequently in a printed version in issue 1 (January) of *Nematology* in 2013 (Inserra et al. 2013). Concomitantly, a team of nematologists including Y. Zeng, W. Ye, L. Tredway, S. Martin and M. Martin characterized morphologically and molecularly two populations (total of 11 females and 1 male) of *Hemicaloosia* from North and South Carolina and described them as a new species named *Hemicaloosia graminis*. The description was received for publication 17th March, 2012 and published only in an on-line version of the issue 2 (June) of *Journal of Nematology* in 2012 (Zeng et al., 2012), without any registration of the work in ZooBank, although *Journal of Nematology* is not a printed Journal.

A morphological comparison of adults of the two *Hemicaloosia* indicates that their morphological features and morphometrics overlap in the two descriptions, in spite of the fact that in the description of *H. graminis* the tail length values for females reported in tables and figures were not in agreement. The two new *Hemicaloosia* also share the same host Bermuda grass (*Cynodon dactylon*). The line drawings for the two species are very similar. A comparison of the morphological features observed at SEM cannot be made because SEM observations are available only for *H. vagisclera* and lack in *H. graminis*. A major characteristic of *H. vagisclera* females consisting of a sclerotized *vagina vera,* from which the name of the Florida species was derived, was not emphasized in the description of *H. graminis*, but well illustrated in line drawings of this species. These results suggest that the two *Hemicaloosia* are morphologically identical. Comparison of 18S rRNA gene sequences for *H. graminis* (JQ446376) and *H. vagisclera* (JQ246425, JQ246426) revealed that in the length of 1496 bp differed in one nucleotide, whereas ITS1 (JQ446376, JQ246427) sequences were identical. The striking morphological and molecular resemblances between these newly described *Hemicaloosia* indicate that they belong to one and the same species.

Taking in account the amended rules of ICZN and the fact that the work by Zeng et al. (2012) was published in electronic form only and no printed version of it was made available, we concluded that the electronic publication by Zeng et al. (2012) with the new species name *H. graminis*, does not meet the requirements of article 8.5.3 of ICZN, as the work itself was not registered in ZooBank. Thus, the name *H. graminis* is not available from the electronically published work of Zeng et al. (2012), whereas the name of *H. vagisclera* is available from the edition printed in January 2013, and is the earliest Code-compliant name for this taxon.

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