



***Myrsidea* Waterston (Phthiraptera: Menoponidae) from wrens (Passeriformes: Troglodytidae), with descriptions of three new species**

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Abstract

Three new species of *Myrsidea* parasitic on members of the avian family Troglodytidae are described herein. They and their type hosts are *M. whitemani* ex the Rufous-naped Wren, *Campylorhynchus rufinucha* (Lesson, 1838), *M. bessae* ex the Riverside Wren, *Thryothorus semibadius* Salvin, 1870, and *M. vincesmithi* ex the Rufous-breasted Wren, *Thryothorus rutilus* Vieillot, 1819. *Myrsidea troglodyti* (Denny, 1842) is redescribed and a lectotype designated. Results of sequencing a portion of the mitochondrial COI gene for one of these species and several other species of *Myrsidea* are given to compare genetic divergence.

Key words: chewing lice, mitochondrial COI, sequencing

Introduction

To date, *Myrsidea troglodyti* (Denny, 1842) represents the only species of this genus recognized from wrens (Passeriformes: Troglodytidae) as delimited by Dickinson (2003). Herein we describe and illustrate three new species of *Myrsidea* from wrens.

In the following descriptions, all measurements are in millimeters. Abbreviations are TW, temple width; HL, head length; PW, prothorax width; MW, metathorax width; AWIV, abdomen width at segment IV; ANW, female anus width; GL, male genitalia length; and TL, total length. Types for each new species will be deposited, as indicated, in the collection of the National Museum of Natural History, Smithsonian Institution, Washington, DC (USNM); The Natural History Museum, London, England (TNHM); or the collection of the Illinois Natural History Survey, Champaign, Illinois (INHS).

Genus *Myrsidea* Waterston

Myrsidea Waterston, 1915: 12. Type species: *Myrsidea victrix* Waterston, 1915, by original designation.

A thorough characterization of this genus may be found in Clay (1966). We provide here only the characters we have found to be pertinent to the delineation of the genus as it pertains to the wren lice.

Head evenly rounded anteriorly; lacking lateral slit or notch; with long inner and minute outer occipital seta on each side; each temple margin with 4 very long setae; without ventral sclerotized processes; gula with 5, less often 4 or 6, setae on each side with posterior seta heavier and longer than those anterior to it.

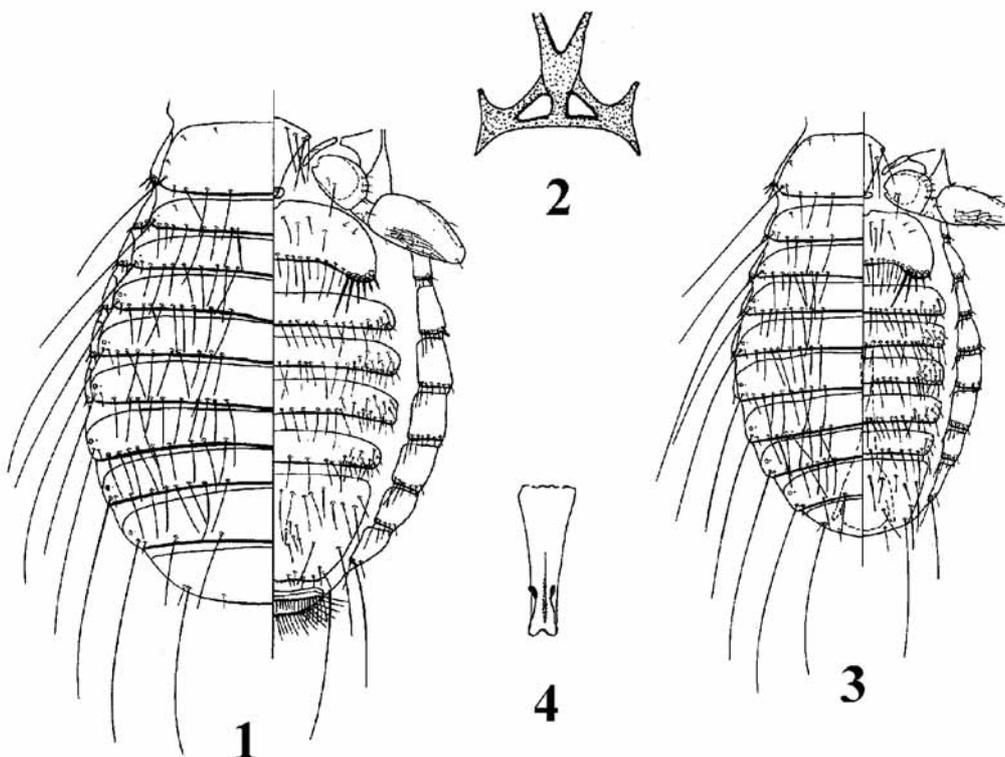
Thorax with pronotum lacking central setae; with 3 short setae at each lateral angle and 6 longer medio-posterior marginal setae. Mesonotum well defined, with 2 minute medioanterior setae adjacent to postnotum and 2 minute setae at posterior margin. Metanotum (Fig. 1) not enlarged, without central setae, but with 6 short anterior setae around periphery and with very long seta at lateroposterior corner in addition to other marginal setae. Prosternal plate well developed, elongate, with 2 short anterior setae; metasternal plate prominent, diamond shaped; venter of femur III with setal brush.

Abdomen (Figs. 1, 3) having undivided tergites; without anterior setae except for very small seta near lateroanterior corner on each side of tergite I (not included in setal count); all tergal setal rows with pronounced gap in center of each row; sternite I small, without setae; sternite II enlarged, with aster of small number of heavy setae at each lateroposterior corner. Postspiracular setae very long on I (0.23–0.30), extremely long on II, IV, and VIII (at least 0.40). Pleurites without anterior setae. Female anus oval, without inner setae. Female subgenital plate of fused sternites VII–IX; setae given for VII represent those anteriorly located on region of segment VII, and those for VIII–IX are the remainder of the plate setae. Male subgenital plate of fused sternites VIII–IX; setae given for VIII represent those anteriorly located on region of segment VIII; remainder of plate setae not quantified; genitalia of characteristic shape (Fig. 9), with spinous sac having distinctively shaped associated sclerite (Figs. 4, 8).

Sexual dimorphism limited to males having smaller dimensions, often sparser abdominal chaetotaxy, and differences associated with posterior abdomen. Both sexes with similar pattern of postspiracular setal lengths. The above-listed characters will not be repeated in the species descriptions.

***Myrsidea whitemani* Price, Johnson, and Dalglish, new species**
(Figs. 1–4)

Type host. *Campylorhynchus rufinucha* (Lesson, 1838), the Rufous-naped Wren.



FIGURES 1–4. *Myrsidea whitemani*. 1. Female dorsoventral metathorax and abdomen. 2. Female hypopharyngeal sclerites. 3. Male dorsoventral metathorax and abdomen. 4. Male genital sac sclerite.

Female. Head with weakly developed hypopharyngeal sclerites (Fig. 2). Dorsoventral metathorax and abdomen as in Fig. 1. Metanotal posterior margin with 10 setae; metasternal plate with 6–8 setae. Without any obviously enlarged tergites, but with slight medioposterior convexity on III and IV. Tergal setae: I, 17–18; II, 18–21; III, 21–23; IV, 22–26; V, 21–25; VI, 22–24; VII, 17–18; VIII, 8. Postspiracular setae on III and V–VII all at least 0.35 long. Pleurites: I–II with relatively uniform short setae; III–VII with fine longer setae toward midline; VIII with unusually long seta flanked on each side by much shorter seta. Sternal setae: II, each aster with 5–6 including quite long inners, 16–20 marginal between asters, 10–15 anterior; III, 33–38; IV, 50–54; V, 49–57; VI, 36–40; VII, 18–20; VIII–IX, 25–31. Anus with 34–36 ventral, 30–38 dorsal fringe setae. Dimensions: TW, 0.51–0.53; HL, 0.29–0.33; PW, 0.33–0.35; MW, 0.51–0.52; AWIV, 0.78–0.86; ANW, 0.27–0.29; TL, 1.68–1.81.

Male. Metathorax and abdominal pleurites (Fig. 3) as for female. Tergal setae: I, 12–13; II, 19–21; III–VI, 20–22; VII, 16–17; VIII, 8. Sternal setae: II, 5 in each aster, 15–16 marginal between asters, 12 anterior; III, 27–31; IV, 40–42; V, 36–44; VI, 35–36; VII, 21–22; VIII, 9. Genital sac sclerite slender throughout length (Fig. 4). Dimensions: TW, 0.46–0.47; HL, 0.28–0.29; PW, 0.31–0.32; MW, 0.40–0.41; AWIV, 0.58–0.60; GL, 0.44–0.46; TL, 1.46–1.49.

Type material. Holotype female (to USNM), ex *C. rufinucha*, **COSTA RICA:** Guanacaste, Santa Maria, Hacienda Solimar, 5 May 1995, Fisher & JS #2178. Paratypes: 4 females, 1 male (to USNM), 1 female, 1 male (to INHS), same data as holotype.

Remarks. Both sexes of this species may readily be recognized by a combination of their large dimensions, their large number of abdominal tergal and sternal setae, their longer and more numerous aster setae on sternite II, and the hypopharynx with weakly developed sclerites.

Etymology. This species is named in honor of Noah Whiteman, Harvard University, Cambridge, Massachusetts, in recognition of his contributions to understanding the ecology and population genetics of bird lice.

***Myrsidea bessae* Price, Johnson, and Dalglish, new species**

(Figs. 5–9)

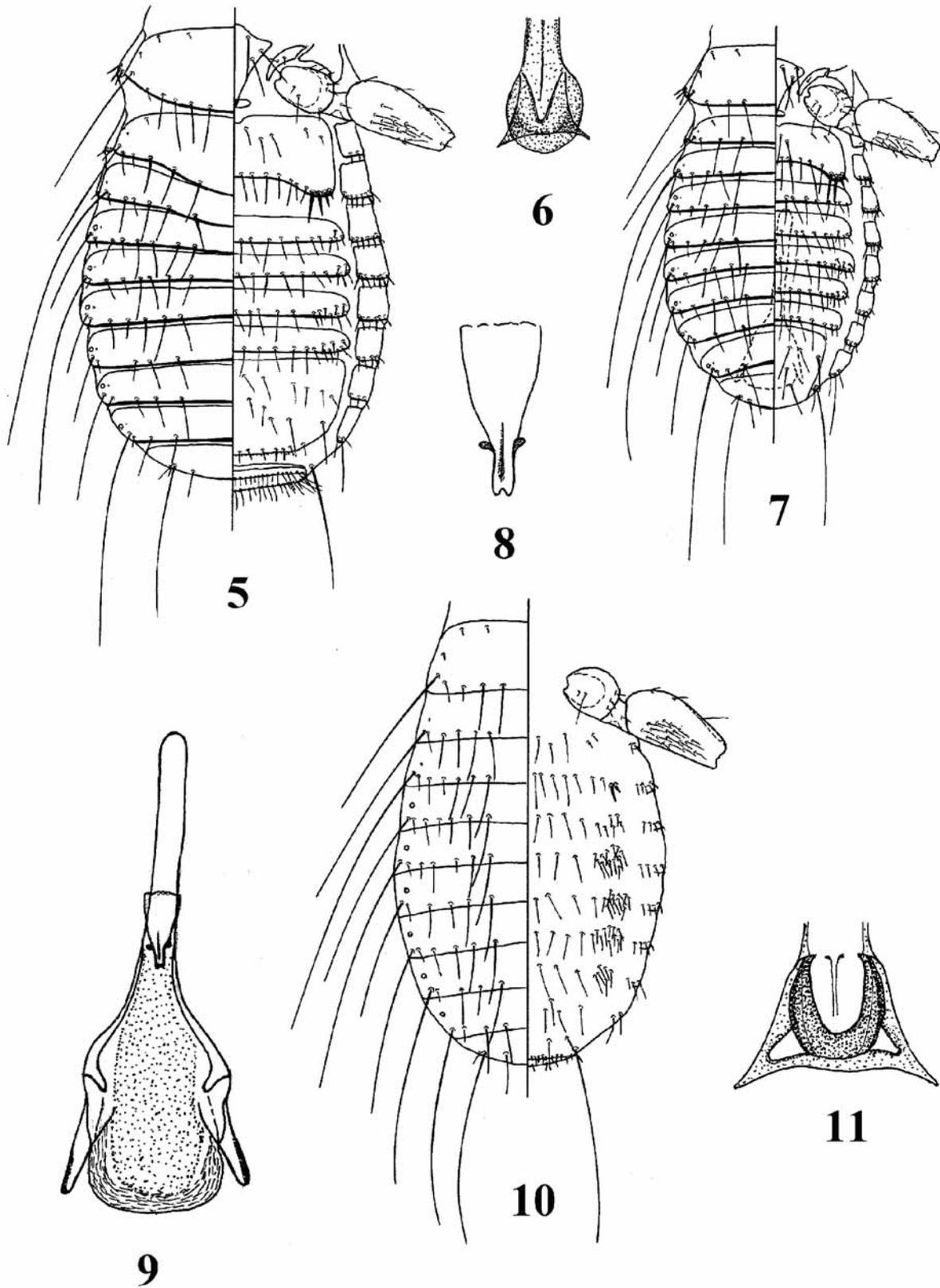
Type host. *Thryothorus semibadius* Salvin, 1870, the Riverside Wren.

Female. Head with strongly developed hypopharyngeal sclerites (Fig. 6). Dorsoventral metathorax and abdomen as in Fig. 5. Metanotal posterior margin gently rounded, with 10–13 setae; metasternal plate with 6–8 setae. With tergite I enlarged, medioposteriorly convex, slightly compressing tergites II–III. Tergal setae: I, 12–14; II, 14–15; III, 15–16; IV, 14–17; V, 14–16; VI, 10–13; VII, 8–10; VIII, 8. Postspiracular setae shortest on V–VI (<0.20 long), slightly longer on III and VII but all much shorter than those on II, IV, or VIII. Pleurites: I–VII with relatively uniform short setae; VIII with long seta flanked on each side by much shorter seta. Sternal setae: II, each aster with 4, less often 3, short setae, 12–15 marginal between asters, 8–10 anterior; III, 19–23; IV, 23–31; V, 25–33; VI, 23–26; VII, 8–14; VIII–IX, 18–24. Anus with 28–33 ventral, 29–36 dorsal fringe setae. Dimensions: TW, 0.44–0.46; HL, 0.31–0.32; PW, 0.27–0.30; MW, 0.44–0.47; AWIV, 0.56–0.63; ANW, 0.21–0.22; TL, 1.45–1.55

Male. Dorsoventral metathorax and abdomen as in Fig. 7. Metanotal posterior margin straight, with 6–9 setae; metasternal plate with 4–6 setae. Tergal setae: I, 8–9; II–V, 12–14; VI, 10–12; VII, 8–10; VIII, 8. Sternal setae: II, 4 short setae in each aster, 9–10 marginal between asters, 7–8 anterior; III, 16–18; IV, 18–22; V, 22–24; VI, 21–24; VII, 11–15; VIII, 5–6. Genital sac sclerite tapered from broad anterior portion (Fig. 8). Dimensions: TW, 0.41; HL, 0.28–0.31; PW, 0.26–0.28; MW, 0.37–0.38; AWIV, 0.44–0.47; GL, 0.38–0.41; TL, 1.19–1.28.

Type material. Holotype female (to INHS), ex *T. semibadius*, **PANAMA:** Charco Azul, 2 Mar. 2006, JMD 888, K. Johnson. Paratypes: 1 female, 1 male, same data as holotype; 1 female, 1 male, same except JMD 886 (to INHS).

Other material. 3 females, 2 males, ex *T. fasciatoventris* Lafresnaye, 1845, the Black-bellied Wren, PANAMA: Charco Azul, 2 Mar. 2006, JMD 894, K. Johnson (INHS).



FIGURES 5–11. 5–9. *Myrsidea bessae*. 5. Female dorsoventral metathorax and abdomen. 6. Female hypopharyngeal sclerites. 7. Male dorsoventral metathorax and abdomen. 8. Male genital sac sclerite. 9. Male genitalia. 10–11. *M. troglodyti*, third instar nymph. 10. Dorsoventral metathorax and abdomen. 11. Hypopharyngeal sclerites.

Remarks. Both sexes of *M. bessae* are separable from those of *M. whitemani* by being smaller in all dimensions, by having fewer abdominal tergal and sternal setae, by their shorter and smaller number of aster setae on sternite II, and by their well-developed hypopharyngeal sclerites.

Etymology. This species is named in honor of Emilie Bess, Illinois Natural History Survey, Champaign, Illinois, in recognition of her contributions to electronic resources on lice.

Myrsidea vincesmithi Price, Johnson, and Dalglish, new species

Type host. *Thryothorus rutilus* Vieillot, 1819, the Rufous-breasted Wren.

Female. Unknown.

Male. As for *M. bessae*, except as follows. Metanotum with 11 marginal setae; metasternal plate with 6 setae. Tergal setae: I, 13; II, 16; III–IV, 18; V, 16; VI, 15; VII, 14; VIII, 12. Postspiracular setae shortest on III and V–VI (not >0.21 long), extremely long on VII, as long as on VIII. Sternal setae: II, each aster of 3 or 4 setae, 17 marginal between asters, 10 anterior; III, 20; IV, 26; V, 31; VI, 27; VII, 19; VIII, 8. Dimensions: TW, 0.43; HL, 0.29; PW, 0.28; MW, 0.39; AWIV, 0.47; GL, 0.40; TL, 1.22.

Type material. Holotype male (to TNHM), ex *T. rutilus*, **TRINIDAD:** Cumuto, 17 May 1960, TRVL 4398, Brit. Mus. 1974-636.

Remarks. While we generally are reluctant to describe a new species from only a single specimen, the differences are so marked in this case that we feel justified in doing so. This species is closest to *M. bessae*, but is separable by having more setae on all abdominal tergites and sternites as well as on the metanotal margin, and by having an extremely long postspiracular seta on tergite VII.

Etymology. This species is named in honor of Vincent Smith, The Natural History Museum, London, in recognition of his contributions to taxonomic databases for lice and work on louse systematics.

Myrsidea troglodyti (Denny, 1842)

(Figs. 10–12)

Menopon troglodyti Denny, 1842: 200. Type host: "*Troglodytes Europaeus*" = *Troglodytes troglodytes* (Linnaeus, 1758), the Winter Wren.

This species is the first and only *Myrsidea* to date that has been described from a member of the Troglodytidae. What is surprising is that the type series used by Denny for this description is composed only of four immatures, each mounted on its own slide which are displayed in Fig. 12. A slide with a late third instar nymph showing evidence of the female setae developing beneath the nymphal integument bears a pencil inscription designating it as the type female. The other specimens represent two more third instars in an earlier state of development and a smaller louse, most likely a second instar. Denny does not mention the sex of these specimens and his vague description is of little value. Denny worked from specimens on cards, although his collection was mounted in Canada balsam on microscope slides sometime prior to 1937 by persons unknown. Thompson (1937) itemized the lice in the Denny collection at the British Museum (Natural History) and only listed two females of *M. troglodyti* from *T. t. troglodytes* [*"T. parvulus*, Wren, Britain", on slide labels]. These slides bear the acquisition numbers (1852-98) of the Denny collection and undoubtedly represent two of the four specimens originally examined by Denny. We have examined these slides which are displayed (Fig. 12).

Third instar nymph. Head with moderately developed hypopharyngeal sclerites (Fig. 11). Dorsoventral metathorax and abdomen as in Fig. 10. Metanotal margin with 10–11 setae; metasternal plate with 10 setae. All abdominal tergites of similar size. Tergal setae: I, 12–14; II–III, 13–15; IV, 14; V, 11–12; VI, 12; VII, 9–11; VIII, 8. Postspiracular setae very long to extremely long on all segments, shortest on V. Pleurites I–VII

with relatively uniform short setae, VIII with pair of slightly longer setae. Sternal setae: II, each aster with only 2 short setae, 13–15 marginal between asters, 10–11 anterior; III, 16–22; IV, 27–33; V, 34–35; VI, 32–36; VII, 15–17; VIII–IX, 13–14. Dimensions: TW, 0.54–0.56; HL, 0.35–0.37; PW, 0.36–0.38; MW, 0.52–0.59; AWIV, 0.72–0.82; TL, 1.74–1.78.



FIGURE 12. Image of four slides of *M. troglodyti*, Lectotype third from left.

Material. 3 third instar, 1 second instar nymphs, ex *T. troglodytes*, all representing type series for *M. troglodyti*, **BRITAIN**, Denny Collection 1852-98. Though one slide is marked "type" and Hopkins and Clay (1952:234) indicate that the type is at the British Museum (Natural History), neither Denny nor anyone else designated a type specimen of this species. We hereby designate the third instar nymph described above as the Lectotype and return it to The Natural History Museum, London.

Remarks. While there are difficulties comparing a species represented only by immature lice with those represented by adults, the lengths of the postspiracular setae of *M. troglodyti* are similar to those of *M. whitemani* and distinct from those of the other two species described above. Also, the head dimensions of *M. troglodyti* are larger than any of the others, the metasternal plate has 10 setae, and there are indications of a possible significantly smaller number of tergal and sternal setae, including the very weak aster of only two setae. Most of these features for *M. troglodyti* point up a closer relationship to *M. whitemani* than to the others, but we feel the evidence supports the recognition of all as distinct taxa until a study of adults from *T. troglodytes* reveals otherwise.

Discussion

Though there are 76 species of wrens (Troglodytidae), we obtained material of *Myrsidea* from only the five species of hosts mentioned herein. This suggests that either prevalence of *Myrsidea* on wrens is quite low or that collecting attempts have been few. The only species of *Myrsidea* described to date was *M. troglodyti* by Denny (1842) and is only known from the four nymphs of the type series. Unfortunately, we were unable to obtain additional material from its host, *T. troglodytes*, even though this bird is widely distributed in the Holarctic Region.

We were able to obtain fresh specimens of *M. bessae* from both of its host species. Sequences of a 379 base pair portion of the mitochondrial COI gene (GenBank accession numbers EU289213-EU289214) were obtained for *M. bessae* from both *Thryothorus semibadius* and *T. fasciatoventris*. These lice were collected at the same locality in Panama. Uncorrected percent sequence divergence between these two specimens was 5.0%. In comparison with several other New World species of *Myrsidea*, the closest species was *Myrsidea* sp. ex *Pachyramphus homochrous* P.L. Sclater, 1859, at 12.4%. The divergence between hosts for *M. bessae* (at 5.0%), while somewhat appreciable, is generally less than that seen between other closely related species of lice, which are usually over 10% (Johnson and Price 2006; Price and Johnson 2006a, 2006b). In addition to the morphological similarity these molecular data justify the conspecific status of *Myrsidea* on these two different wren host species.

Acknowledgments

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