

A New Species of *Thomomydoecus* (Mallophaga: Trichodectidae) from *Thomomys bottae* Pocket Gophers (Rodentia: Geomyidae)

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ABSTRACT: *Thomomydoecus*, originally placed as a subgenus of *Geomydoecus*, is re-described and elevated to generic rank. The new species *T. byersi* is described from *Thomomys bottae aureus* from Colorado and *T. b. fulvus* from New Mexico.

Following the revision of *Geomydoecus* Ewing by Price and Emerson (1971), the new subgenus *Thomomydoecus* was erected by Price and Emerson (1972) to include 6 species of pocket gopher lice. Of these, 5 are restricted in their host distribution to subspecies of *Thomomys bottae* (Eydoux and Gervais) and *T. umbrinus* (Richardson) with the remaining species found on *T. talpoides* (Richardson).

Extensive collecting of lice from *T. bottae*-group gophers since then revealed that members of *Thomomydoecus* were widely distributed and that they included a number of undescribed taxa. Taxonomic analysis of these lice by Price and Helleenthal (1980a, 1980b) increased the number of recognized species of *Thomomydoecus* found on *bottae*-group gophers to 16. These were separated into the *neopepei* complex containing 7 species whose males have tergites II-III with long clustered setae, and the *minor* complex containing 9 species whose males have tergites II-III with short, widely spaced setae. Additional collecting from *Thomomys bottae* hosts from Colorado and New Mexico has revealed the existence of an additional undescribed *Thomomydoecus* species which shows many morphological similarities to *T. wardi* (Price and Emerson), the only described *Thomomydoecus* louse known to occur on *Thomomys talpoides*.

We have restricted the scope of this paper to the elevation of the subgenus *Thomomydoecus* to generic status, description of an additional louse species, and the presentation of associated distributional host and locality data. No attempt is made to discuss the significance of these distributions, as we feel that this can best be done after the taxa of all louse complexes on *Thomomys bottae*-group gophers have been delineated.

Our studies of *Thomomydoecus* lice have included examination and identification of 8770 specimens with quantitative morphological data obtained from 2263 specimens representing both sexes of all known species. Quantitative character data for lice evaluated in this study combined with their host and locality information are included as part of a computerized pocket gopher louse data base maintained at the University of Notre Dame. The retrieval and analysis of these data were performed with an integrated group of computer programs developed by the authors and called the BUG system. A description and explanation of our data handling and analysis procedures may be found in Helleenthal and Price (1980).

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In the following species description, counted or measured characters are followed by the minimum and maximum observed values, then the sample size, mean, and standard deviation in parentheses. Measurements are in millimeters. Measurement procedures are illustrated in Price and Hellenthal (1980a, 1980b). Illustrations are for specimens from the type-host. In the "Material" section, original locality data expressed in miles are followed parenthetically by the metric equivalent to 0.1 km. The English figure, rather than the metric, expresses the precision of the location estimate. Full locality information for all hosts contained within the data base, including latitude, longitude, and in many cases elevation, is available from the authors.

Thomomydoecus Price and Emerson

Geomydoecus (*Thomomydoecus*) Price and Emerson, 1972, J. Med. Entomol. 9: 464.

TYPE-SPECIES: *G. (T.) jamesbeeri* Price and Emerson, 1972.

MALE: Head wider than long, with medioanterior indentation. Lateroposterior temple corner angular, with 1 slightly stouter marginal seta at apex and finer relatively short adjacent setae. Antenna with very large scape, with posterior margin essentially straight to slightly convex, and remaining 2 segments slender. Pteronotum with 4–6 setae on each side, with median setae relatively short. Prothoracic legs smallest, usually beneath head; legs each with single claw. Abdomen narrow, often noticeably tapered posteriorly from level of segment IV; lacking evident spiracles. Tergites I–VIII and sternites II–VII each with single row of setae; tergites II–III each with paired grouping of setae, varying from short widely-spaced to long compactly-spaced setae; tergoventral setae on IV–VII very short, not extending to posterior segment margin, and distinctly separated from subequally short lateral setae. Pleurites II–IV well-developed, with setae. Small dimensions, head width less than 0.41. Genitalia small, with apically blunt or pointed undivided endomeral plate, fused parameral arch, and sac variably developed but lacking large spines.

FEMALE: Essentially as for male, except as follows. Antenna with 3 segments of similar size. Median setae of pteronotum much longer. Abdominal tergites II–VII having subequally long tergoventral setae, extending to or beyond posterior segment margin and continuous with shorter lateral setae, and without grouping on II–III; last tergite usually with 2 + 2 + 2 setae, less often 1 + 4 + 1, with median setae near midline. Small dimensions, head width occasionally up to 0.44, but usually not over 0.42. Subgenital plate broad, U-shaped, without medioposterior or medioanterior setae, without evident transverse postvulval sclerites, and with irregular row of lateral marginal to submarginal setae, most setae terminating far from end of abdomen. Conspicuous slender gonapophyses; genital chamber sac small, with lines weak to inconspicuous.

REMARKS: Initially established by Price and Emerson (1972) as a subgenus of *Geomydoecus*, sufficient differences exist between *Thomomydoecus* and *Geomydoecus* sensu stricto to justify elevation of *Thomomydoecus* to generic status. Members of *Thomomydoecus* may most readily and consistently be separated from those representing the 85 recognized taxa of *Geomydoecus* by the former possessing the following combination of features: (1) unique shape and chaetotaxy

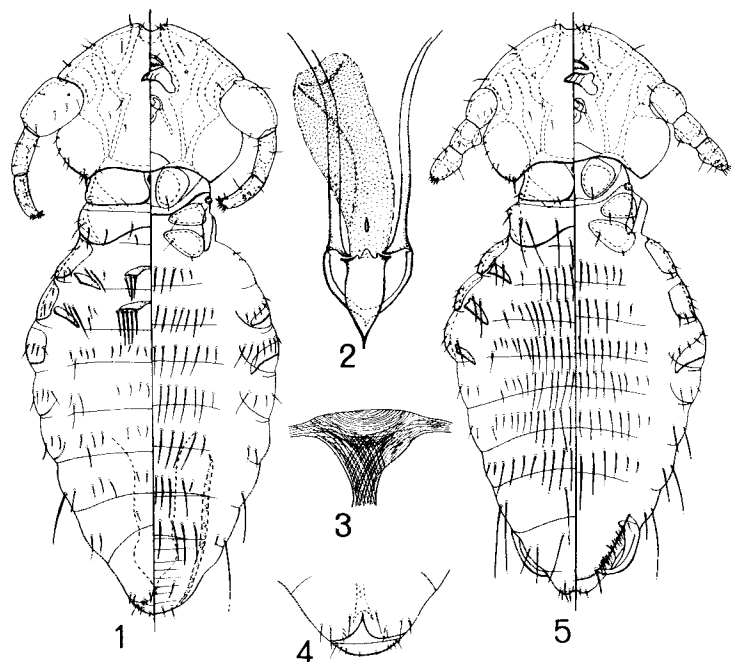
of the lateroposterior temple margin (Figs. 1, 5); (2) male abdominal tergites II–III each with a paired grouping of setae (Fig. 1); and (3) female ventral terminalia having a U-shaped subgenital plate, with distinctive associated chaetotaxy (Fig. 5). Other supplemental characteristics, such as the details and small size of the male genitalia, the weakly-developed to inconspicuous female genital chamber sac, the chaetotaxy of the female last abdominal tergite, and the small dimensions in conjunction with a narrow tapered abdomen, will further aid in distinguishing *Thomomydoecus* from *Geomydoecus*.

Problems with separation might occasionally be encountered when employing only a single character. For example, *Geomydoecus copei* Werneck has grouped setae on male tergites II–III as does *Thomomydoecus*, but has the temple margin and female subgenital plate as for *Geomydoecus*. Also, *G. perotensis* Price and Emerson and possibly several other taxa have an unusual female subgenital plate that protrudes posteriorly and might be mistaken for U-shaped, but the chaetotaxy of this area is quite different from *Thomomydoecus* and other characters support the separation from that genus. Therefore, even though some primary character may, on occasion, not provide absolute separation, there should be no difficulty in assigning specimens to these genera. Both sexes of *Thomomydoecus* are usually so different in overall body shape and size from *Geomydoecus* as to make sorting under a dissection microscope an easy matter. Thus, despite the invariable occurrence of *Thomomydoecus* on the same host individuals as *Geomydoecus*, the abundance of morphological differences easily justifies the recognition of these 2 separate genera.

Thomomydoecus byersi, new species
(Figs. 1–5)

MALE: As in Fig. 1. Temple width 0.380–0.405 (9: 0.387 ± 0.0083); head length 0.270–0.305 (8: 0.286 ± 0.0103); submarginal and inner marginal temple setae 0.015–0.025 (9: 0.023 ± 0.0036) and 0.030–0.040 (8: 0.035 ± 0.0027) long, respectively, with submarginal seta lateroanterior to inner marginal seta. Antenna with scape length 0.115–0.135 (8: 0.129 ± 0.0070), scape width 0.075–0.100 (8: 0.086 ± 0.0093). Prothorax width 0.235–0.285 (9: 0.263 ± 0.0155). Tergal setae: I, 2; II, 7–11 (9: 8.4 ± 1.13); III, 11–16 (9: 14.4 ± 1.42); IV, 15–21 (9: 18.0 ± 1.94); V, 14–19 (9: 16.1 ± 1.62); VI, 11–16 (9: 13.0 ± 1.50); tergal and pleural setae on VII, 14–17 (8: 14.9 ± 1.13). Dorsal terminalia (Fig. 4) broadly rounded, with chaetotaxy as shown, and without sensilla. Sternal setae: II, 8–11 (9: 9.3 ± 0.87); III, 12–15 (9: 13.3 ± 1.12); IV, 15–19 (9: 16.9 ± 1.36); V, 13–17 (9: 15.0 ± 1.12); VI, 11–14 (9: 12.6 ± 1.01); VII, 9–11 (9: 10.4 ± 0.73); VIII, 6–8 (9: 7.2 ± 0.67). Total length 1.120–1.340 (9: 1.211 ± 0.0682). Genitalia as in Fig. 2; parameral arch broad, rounded, with small medioposterior protuberance, width 0.085–0.100 (9: 0.093 ± 0.0043); endomeral plate broad anteriorly, sharply pointed posteriorly, width 0.040–0.050 (9: 0.045 ± 0.0028), length 0.095–0.110 (7: 0.105 ± 0.0056); with large conspicuous spinose sac.

FEMALE: As in Fig. 5. Temple width 0.395–0.425 (9: 0.407 ± 0.0083); head length 0.275–0.305 (8: 0.287 ± 0.0088); submarginal and inner marginal temple setae 0.025–0.035 (4: 0.031 ± 0.0048) and 0.035–0.040 (7: 0.038 ± 0.0027) long, respectively, positioned as for male. Prothorax width 0.260–0.305 (8: 0.282 ±



Figs. 1-5. *Thomomydoecus byersi*, n. sp.: 1, male; 2, male genitalia; 3, female genital sac; 4, male terminalia, dorsal view; 5, female.

0.0166). Tergal setae: I, 2; II, 11-16 (9: 13.1 ± 1.45); III, 19-27 (9: 21.6 ± 2.70); IV, 23-34 (9: 27.9 ± 3.79); V, 22-29 (9: 24.8 ± 2.11); VI, 21-30 (9: 23.8 ± 2.73); tergal and pleural setae on VII, 25-32 (9: 27.1 ± 2.26); median setae tergite VIII, 2. Longest seta of medial 10 on tergite VI, 0.075-0.110 (9: 0.099 ± 0.0097); on tergite VII, 0.100-0.120 (8: 0.112 ± 0.0064), with 0-5 (8: 2.0 ± 1.51) of these longer than 0.100. Longest of medial setae on tergite VIII, 0.090-0.110 (9: 0.102 ± 0.0070). Last tergite with 2 lateral setae close together on each side and pair near midline; outer seta 0.050-0.080 (8: 0.069 ± 0.0110), middle seta 0.065-0.085 (8: 0.077 ± 0.0074), inner seta 0.060-0.085 (7: 0.074 ± 0.0086) long. Sternal setae: II, 10-14 (9: 11.8 ± 1.39); III, 13-18 (8: 14.4 ± 1.77); IV, 16-20 (8: 19.0 ± 1.41); V, 15-21 (9: 17.7 ± 1.80); VI, 14-19 (9: 16.3 ± 1.80); VII, 11-13 (9: 12.1 ± 0.78). Subgenital plate with 30-36 (9: 32.9 ± 1.97) setae, with longer heavier medioposterior seta on each side. Genital sac with close-set faint lines much as in Fig. 3; width 0.150-0.190 (8: 0.171 ± 0.0159), length 0.055-0.125 (6: 0.103 ± 0.0279). Total length 1.065-1.405 (8: 1.255 ± 0.1104).

MATERIAL: Holotype male, *Thomomys bottae aureus* J. A. Allen (Colorado Museum skin #719), Bondad, La Plata Co., Colorado, 22.VI.1913; in collection

of the U.S. National Museum of Natural History. Paratypes: 1 male, same as holotype; 4 males, 1 female, same, except Colorado Museum skin #717, 23.VI.1913; 2 females, same, except Colorado Museum skin #715, 21.VI.1913; 1 male, 2 females, same, except Colorado Museum skin #716, 17.VI.1913; paratypes at U.S. National Museum, Oklahoma State University, and University of Minnesota. Other material: 2 males, 4 females, *T. b. fulvus* (Woodhouse) (University of New Mexico 11008), Montosos Camp Meeting Ground, 14 mi (22.5 km) W Magdalena, Socorro Co., New Mexico.

REMARKS: The male of *Thomomydoecus byersi*, on the basis of the long clustered setae on tergites II-III and genitalic details, goes to couplet 13 in the modified key presented by Price and Emerson (1972), thereby bypassing the 9 species of the *minor* complex. The male genitalia of *T. byersi*, with the wide parameral arch and large well-developed sac, resemble more closely those of *T. wardi* than any of the 7 members of the *neocopei* complex. However, the unique shapes of both the endomeral plate and the parameral arch readily separate *T. byersi* from *T. wardi*. The female of *T. byersi*, by having an evident genital sac with faint line configuration, also shows affinities to *T. wardi*; no females of any of the other 16 species have an evident genital sac.

It is interesting to note that *T. byersi*, taken from *Thomomys bottae* gophers, should more closely resemble *T. wardi*, which is known only from *Thomomys talpoides* and is the only *Thomomydoecus* thus far taken from gophers outside of the *bottae*-group. The geographical range of *T. wardi* extends very closely to the areas from which *T. byersi* was taken. However, the fact that we have seen *T. byersi* from 5 *Thomomys bottae* gophers representing 2 widely-separated localities and that in each instance specimens of *G. a. aurei* Price and Hellenthal were collected from the same host has convinced us that this is a *bottae* louse and not a *talpoides* louse.

This species is named for Dr. George W. Byers, University of Kansas, in appreciation of his many contributions to systematic entomology and in honor of his sixtieth birthday.

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