

***Cummingsia micheneri*, a New Species of
Mallophaga (Trimenoponidae) from a Venezuelan
Mouse-Opossum (Marsupialia)**

ROBERT M. TIMM¹ AND ROGER D. PRICE²

ABSTRACT: The previously recognized species of chewing louse, *Cummingsia intermedia* Werneck (Mallophaga: Trimenoponidae), is redescribed and illustrated. A new species, *C. micheneri*, is described and illustrated for lice from a Venezuelan mouse-opossum, *Marmosa dryas* (Marsupialia: Didelphidae); this material had earlier been misidentified as *C. intermedia*. Additionally, we discuss identification of these two closely related species and indicate characters that are useful in distinguishing them from all other known species of *Cummingsia*. A key is provided for the 10 recognized species of the genus.

Nine species of chewing lice have been described to date in the mallophagan genus *Cummingsia* Ferris (Trimenoponidae). Most of these are host-specific parasites on the smaller South American marsupials of the genera *Caenolestes*, *Lestoros*, *Marmosa*, and *Monodelphis*; however, two species are now known from the rodent genus *Thomasomys* (Price and Emerson, 1986; Timm and Price, 1985, 1988). In our review (Timm and Price, 1985) of *Cummingsia*, we predicted that numerous new species were yet to be discovered. This prediction is proving accurate as three new species of *Cummingsia* (*C. barkleyae* Price and Emerson, *C. gardneri* Price and Emerson, and *C. izori* Timm and Price) have been described since 1985. Additionally, we herein recognize yet another new species of *Cummingsia* from a Neotropical mouse-opossum of the genus *Marmosa*.

Werneck (1937) described a new species of *Cummingsia*, *C. intermedia*, from a Brazilian mouse-opossum, *Marmosa incana paulensis* Tate. We tried unsuccessfully for several years to locate the type material of *C. intermedia*. The dimensions, details of setal numbers and placement, and aspects of the genitalia that we use today to distinguish species of *Cummingsia* were not treated in sufficient detail by Werneck (1937) in the original written description of *C. intermedia* nor in the illustrations to allow us to place this species. Emerson and Price (1975) provisionally considered a small series of *Cummingsia* from a Venezuelan mouse-opossum, *Marmosa dryas* Thomas, as *C. intermedia*, and we (Timm and Price, 1985) tentatively accepted this identification of these specimens, pointing out, however, that there appeared to be discrepancies between Werneck's illustrations of *C. intermedia* from *Marmosa incana paulensis* and the material we had available from *M. dryas*.

Recently, we were able to locate Werneck's type material of *C. intermedia* in the collection of the Fundação Oswaldo Cruz, Rio de Janeiro, and these specimens were generously made available to us for study. Examination of these specimens has allowed us to redefine *C. intermedia* and to correctly assign the specimens from western Venezuela to an undescribed species. The purposes of this paper

¹ Museum of Natural History and Department of Systematics and Ecology, University of Kansas, Lawrence, Kansas 66045.

² Department of Entomology, University of Minnesota, St. Paul, Minnesota 55108.

Accepted for publication 20 April 1989.

are: 1) to provide a redescription and illustrations of *C. intermedia*; 2) to describe a new species of *Cummingsia* from the mouse-opossum, *M. dryas*; 3) to discuss the identification of these two species; and 4) to provide a key to the 10 species of the genus. Since these two species conform well to the generic and subgeneric descriptions provided in our revision (Timm and Price, 1985), generic-level characters will not be repeated here. All measurements reported herein are in millimeters.

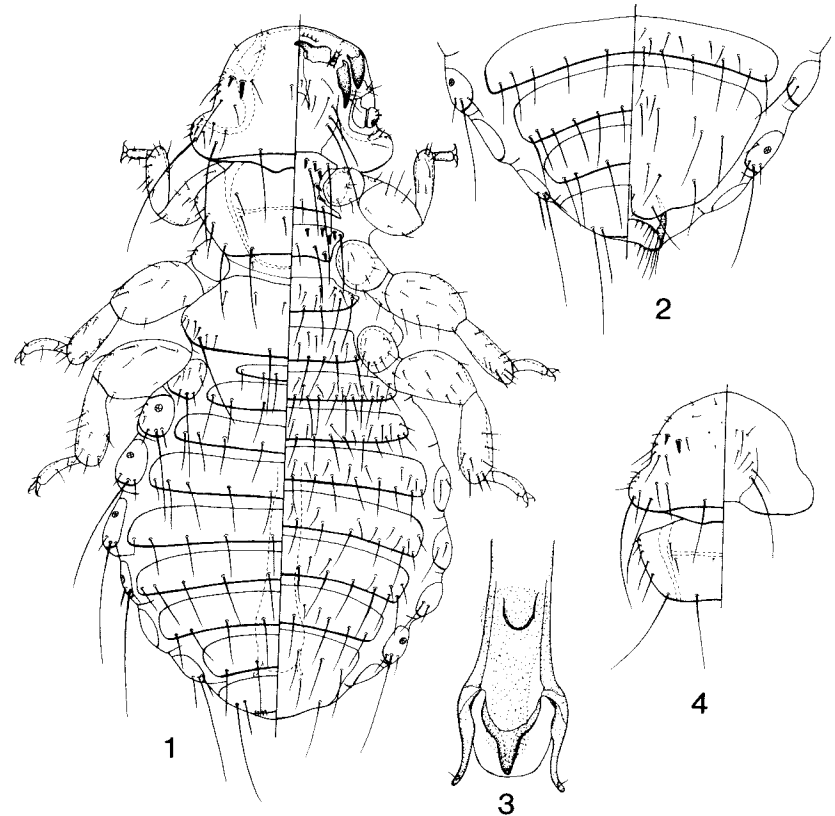
Cummingsia (Cummingsia) intermedia Werneck
(Figs. 1–3)

Cummingsia intermedia Werneck, 1937:70. Type host: *Marmosa incana paulensis* Tate.

MALE: As in Fig. 1. Dorsal head chaetotaxy with seta immediately mediad to large spiniform seta longer than medium mediodorsal seta and adjacent spiniform seta; gula with relatively long seta adjacent to posteriormost very long seta; other setae as shown. Slender pointed inner head spinous process well separated from outer. With reduced carina across posterior head margin and with medioposterior protrusion. Pronotum with pair of central setae of approximately similar length as pair of lateral setae on each side near end of transverse thickening; 6 anterior metanotal setae all of similar length. Prosternal plate with 7 long, 11 short stout setae; mesosternal plate with 5 long, 11 short stout setae; metasternal plate with 24 long to short setae. Abdominal tergal setae on I–IX, respectively, 6, 7, 8, 10, 11, 10, 8, 4, and 4. Abdominal pleura II–VIII each with 3 marginal setae, with medial seta longest. Anterior pleural setae: II, 3–5; III, 2–3; IV–VI, 2; VII–VIII, 0. Total abdominal sternal setae on I–VII, respectively, 18, 40, 34, 32, 27, 22, and 11. Anterior sternal setae (included in totals above) on I–VII, respectively, 11, 22, 18, 16, 13, 8, and 3. Subgenital plate (fused VIII–IX) with 11 setae. Dimensions: preocular width, 0.30; temple width, 0.38; head length, 0.27; prothorax width, 0.34; metathorax width, 0.42; abdomen width at segment V, 0.64; total length, 1.27. Genitalia (Fig. 3) with genital plate broadly tapered, with thin “U”-shaped sac sclerite, and with subapical seta near tip of paramere; genitalia width, 0.10; genital plate width, 0.06; genital plate length, 0.06.

FEMALE: Much as for male, except as follows. Prosternal plate with 10 short stout setae. Abdominal tergal setae on II, VI, VII, and VIII, respectively, 8, 11, 9, and 5. Anterior pleural setae on II, IV, and VII, respectively, 5, 3, and 1. Total abdominal sternal setae on I–VII, respectively, 16, 41, 38, 34, 29, 26, and 17. Anterior sternal setae (included in totals above) on I–VII, respectively, 9, 25, 20, 18, 14, 14, and 8. Terminalia as in Fig. 2. Subgenital plate (fused VII–IX) with 12 setae in region of VIII–IX, including 4 minute setae adjacent to medioposterior division. Anus oval, with 29 setae of lengths as shown. Dimensions: preocular width, 0.32; temple width, 0.41; head length, 0.26; prothorax width, 0.38; metathorax width 0.49; abdomen width at segment V, 0.74; total length, 1.47.

REMARKS: This species is separable from the six previously known species of the subgenus *Cummingsia* by both sexes with: 1) more than 6 setae on most abdominal tergites; 2) the large number of short stout setae on the prosternal and mesosternal plates; 3) the large number of setae on most abdominal sternites; and 4) the large number of metasternal plate setae.



Figs. 1–4. 1–3. *Cummingsia intermedia*. 1. Male. 2. Female terminalia. 3. Male genitalia. 4. *C. micheneri*, chaetotaxy of head and pronotum.

MATERIAL: Holotype male, allotype female of *C. intermedia* from F. L. Werneck Collection at Fundação Oswaldo Cruz, Rio de Janeiro, Brazil, ex *Marmosa incana paulensis*, “Itatiaya, Est. Rio de Janeiro, Brasil”.

Cummingsia (Cummingsia) micheneri Timm and Price, new species
(Fig. 4)

Cummingsia intermedia Emerson and Price, 1975:13, Figs. 19–22 (nec Werneck, 1937:70). Host: *Marmosa dryas* Thomas.

Cummingsia intermedia Timm and Price, 1985:397, Figs. 17–20 (nec Werneck, 1937:70). Host: *M. dryas*.

MALE: Much as for *C. intermedia*, except as follows. Dorsal head chaetotaxy with seta mediad to large spiniform seta nearly same length as spiniform seta, with only minute mediodorsal setae or alveoli (Fig. 4). Gula with much shorter

seta anterior to very long posteriormost seta (Fig. 4). Pronotum with minute pair of central setae (Fig. 4). Prosternal plate with 11–14 short stout setae; mesosternal plate with 8–9 short stout setae; metasternal plate with 22–23 setae. With 8–9 abdominal tergal setae on each of IV–VI. Abdominal pleura II–VI each with only 2 marginal setae, consisting of medial short and lateral long seta on each. Anterior pleural setae: II, 4–5; III–VI, 3–4; VII, 1–2; VIII, 0–1. Total abdominal sternal setae: II, 34–39; III, 26–31; IV, 25–26; V, 21–23; VI, 18–20. Anterior sternal setae: I, 10–11; II, 20–29; III, 11–14; IV, 9; V, 7–10; VI, 5–6; VII, 1–2. Subgenital plate with 10 setae.

FEEMALE: As for male, except as follows. Mesosternal plate with 8–10 short stout setae; metasternal plate with 21–26 setae. Total abdominal sternal setae: III, 23–27; IV, 22–26; V, 20–22; VI, 16–19; VII, 10–12. Anterior sternal setae: I, 8–10; II, 20–23; III–IV, 8–11; V, 6–8; VI, 4–7; VII, 2–3. Terminalia and dimensions near to *C. intermedia*.

REMARKS: Compared to *C. intermedia*, *C. micheneri* is separable by both sexes with: 1) head having shorter seta mediad to large spiniform; 2) only minute setae or alveoli in mediadorsal head region; 3) median pronotal setae minute; 4) fewer total abdominal sternal setae on II–VI; 5) pleura II–VI with only 2 marginal setae; and 6) shorter gular setae anterior to single very long seta. *Marmosa dryas*, the type host of *C. micheneri*, is found in a restricted region of northeastern Colombia and extreme northwestern Venezuela. Historically, *M. dryas* has been considered a member of the subgenus *Thylamys* by Tate (1933) and most subsequent authors. Recently, Creighton (1984) elevated several of Tate's subgenera of the genus *Marmosa* to full generic ranking, including both the subgenus *Marmosa* and *Thylamys*. Additionally, Creighton suggested that *M. dryas* shares affinities with and, in fact, should be included in the genus *Marmosa* (sensu stricto). We certainly concur, based on the relationships of the parasitic Mallophaga, that *M. dryas* is closely related to the mouse-opossums that include *M. incana*. Interestingly, several species of *Cummingsia* are known from mouse-opossums of the genus *Marmosa* (sensu stricto), but no Mallophaga have ever been collected from members of the genus *Thylamys*. We suspect that *C. micheneri* will be found on *M. dryas* throughout its range in northeastern Colombia and northwestern Venezuela.

For reasons which are not yet understood, *Cummingsia* appear to be found in low population densities on their hosts, with potential host individuals frequently harboring no lice. This low number of lice is in marked contrast to the extremely high population densities of many Mallophaga that parasitize mammals. We know that this is not simply an artifact of lack of collecting, because in recent years we have made a concerted effort to collect *Cummingsia* both from living wild-caught marsupials and from museum study skins, and we have requested that our colleagues who are handling wild-caught marsupials collect material for us. Through these efforts we have obtained several new species yet most have been represented by low numbers of individuals.

ETYMOLOGY: This new species is named for Charles D. Michener, University of Kansas, in honor of his 70th birthday, in recognition of his long productive career in entomology, and in appreciation of the friendship that he has shown us.

MATERIAL: Holotype male, ex *Marmosa dryas*, Tabay, Merida, Venezuela, 14.IV.1966; in collection of Oklahoma State University, Stillwater. Paratype female, same data as holotype; 2 male, 2 female paratypes, ex *M. dryas*, Hda. Misisi,

Trujillo, Trujillo, Venezuela, 22/26.I.1966; at Oklahoma State University and U.S. National Museum of Natural History, Washington, D.C.

Key to the Species of *Cummingsia*

Herein we present a key to all known species of the genus *Cummingsia*. Some characters used in this key have been used previously (see Price and Emerson, 1986; Timm and Price, 1985). However, study of this new species and re-examination of all the previously described species have led to our re-evaluation of previously used characters and discovery of new characters for more reliable separation of species.

1. Marginal setae of abdominal tergites and sternites III–VII with obviously shorter among longer setae (see Timm and Price, 1985, Fig. 23); gula with 2 very long posterior setae on each side, aligned more or less transversely (see Timm and Price, 1985, Fig. 21) 2
 - Marginal setae of abdominal tergites and sternites III–VII of subequal lengths, except for occasional 1–2 shorter setae at end of row (Fig. 1); all gular setae aligned longitudinally, with 1 very long seta posteriormost (Fig. 1) (Subgenus *Cummingsia*) ... 3
2. Male genitalic parameres apically tapered and pronouncedly outwardly curved, genitalia width 0.09–0.10, total body length 1.18 or more; female temple width over 0.37, total body length over 1.40, not over 13 setae on tergite II or 15 on tergite III; ex *Monodelphis domestica* (Brazil) and *M. brevicaudata* (Brazil, Venezuela) *peramydis* Ferris
 - Male genitalic parameres not markedly apically tapered nor outwardly curved, genitalia width 0.07–0.08, total body length 1.17 or less; female temple width under 0.37, total body length under 1.35, at least 14 setae on tergite II and 16 on tergite III; ex *Marmosa impavida* (Venezuela) *gardneri* Price and Emerson
3. Abdominal tergites II–VII each with only up to 6 setae 4
 - At least several of abdominal tergites II–VII with more than 6 setae 5
4. Head with pair of laterodorsal spiniform setae on each side, tergite II with 6 setae, sternite III with under 16 setae; ex *Caenolestes fuliginosus* (Ecuador) *albujaui* Timm and Price
 - Head with no dorsal spiniform setae, tergite II with only 4–5 setae, sternite III with over 20 setae; ex *Thomasomys ischyurus* (Peru) *barkleyae* Price and Emerson
5. Prosternal plate with at least 10 short stout setae, mesosternal plate with at least 8 such setae (Fig. 1) 6
 - Prosternal plate with only up to 8 short stout setae, mesosternal plate with only up to 6 such setae 7
6. Mediadorsal head with only minute setae or alveoli (Fig. 4), pair of median pronotal setae minute (Fig. 4), sternite IV with fewer than 30 setae; ex *Marmosa dryas* (Venezuela) *micheneri*, new species
 - Mediadorsal head with pair of medium setae (Fig. 1), median pronotal setae nearly same length as lateral pair (Fig. 1), sternite IV with more than 30 setae; ex *Marmosa incana* (Brazil) *intermedia* Werneck

7. Laterodorsal head without stout spiniform setae, prosternal plate with only 4-6 short stout setae; ex *Thomasomys cinereiventer* (Colombia), *T. laniger* (Colombia), and *T. erro* (Ecuador) *inopinata* Méndez
- Laterodorsal head with stout spiniform setae, prosternal plate with 7-8 short stout setae 8
8. Median pronotal setae minute; median pair of anterior metanotal setae with both usually minute, less often 1 minute, 1 longer; ex *Marmosa noctivaga* (Peru) *izori* Timm and Price
- Median pronotal setae nearly same length as lateral pair; both setae of median anterior metanotal pair longer, similar in length to other anterior setae 9
9. Head with long seta immediately mediad to inner dorsal spiniform seta, several times length of spiniform seta; posterior portion of female subgenital plate with 10 medium to long setae; male genital sac sclerite "V"-shaped; ex *Caenolestes convelatus* (Ecuador) . *perezi* Timm and Price
- Head with short seta immediately mediad to inner dorsal spiniform seta, of similar length to spiniform seta; posterior portion of female subgenital plate with 8 medium to long setae; male genital sac sclerite "butterfly"-shaped; ex *Lestoros inca* (Peru) *maculata* Ferris

Acknowledgments

We thank Sebastião J. de Oliveira, Curator, Fundação Oswaldo Cruz, for assisting us in locating the type material of *C. intermedia* in Werneck's collection and for arranging a loan of this material. With his generous assistance, we were able to establish the identity of the series studied here. We thank Barbara L. Clauson for her constructive comments on this manuscript. This paper is published as Contribution No. 16,503 of the Minnesota Agricultural Experiment Station based on research supported by the Station.

Literature Cited

- Creighton, G. K. 1984. Systematic studies on opossums (Didelphidae) and rodents (Cricetidae). Unpubl. Ph.D. Dissertation. Univ. Michigan, Ann Arbor. 220 pp.
- Emerson, K. C., and R. D. Price. 1975. Mallophaga of Venezuelan mammals. Brigham Young Univ. Sci. Bull., Biol. Ser. 20:1-77.
- Price, R. D., and K. C. Emerson. 1986. New species of *Cummingsia* Ferris (Mallophaga: Trimenoponidae) from Peru and Venezuela. Proc. Biol. Soc. Washington 99:748-752.
- Tate, G. H. H. 1933. A systematic revision of the marsupial genus *Marmosa*, with a discussion of the adaptive radiation of the murine opossums (*Marmosa*). Bull. Amer. Mus. Nat. Hist. 66:1-250.
- Timm, R. M., and R. D. Price. 1985. A review of *Cummingsia* Ferris (Mallophaga: Trimenoponidae), with a description of two new species. Proc. Biol. Soc. Washington 98:391-402.
- Timm, R. M., and R. D. Price. 1988. A new *Cummingsia* (Mallophaga: Trimenoponidae) from a Peruvian mouse-opossum (Marsupialia). J. Kansas Entomol. Soc. 61:76-79.
- Werneck, F. L. 1937. Nova especie do genero *Cummingsia* (Mallophaga: Trimenoponidae). Memorias do Instituto Oswaldo Cruz 32:69-73.