

## A REASSESSMENT OF THE TAXONOMIC POSITION OF THE FOSSIL SPECIES *PROTOPHTHIRIA PALPALIS* AND *P. ATRA* (DIPTERA: BOMBYLIIDAE)

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*Abstract.* Results of examination of the fossil types of *Protophthiria palpalis* and *P. atra* are given and illustrations provided. It is concluded that the genus *Protophthiria* is a subjective junior synonym of *Lithocosmus*. *Tithonomyia*, n. gen., is proposed for *Protophthiria atra*. Subfamilial placement is discussed for both genera.

The types of the fossil species *Protophthiria palpalis* Cockerell and *P. atra* Melander were examined in order to directly compare them with some aberrant pinned specimens of the genus *Phthiria* from the southwestern United States and Durango, Mexico, which initially appeared to agree with the written descriptions and photographs of the 2 fossil species of *Protophthiria*.

After thorough examination of the 2 fossil types it became evident that both species had been generically misidentified. The results of the examinations of the types and comparisons with the original descriptions are given herein.

### **Lithocosmus** Cockerell

*Lithocosmus* Cockerell, 1909: 72.

*Protophthiria* Cockerell, 1914b: 720. **New synonymy.**

### **Lithocosmus palpalis** (Cockerell), **new combination**

Fig. 1-3

*Protophthiria palpalis* Cockerell, 1914b: 720.

Holotype (USNM No. 90505) from Oligocene shale (not Miocene; Lewis 1972, F. Martin Brown, pers. commun.), Florissant, Wilson Ranch, Colorado (Wickham). Mounting medium (of undetermined origin) and a cover slip preserve the holotype mount. The reverse (negative impression) is in excellent condition and is without a preserving medium or a cover slip.

Cockerell (1914b) proposed the genus *Protophthiria* with *palpalis* as the type-species by original monotypy. In this diagnosis, Cockerell states “. . . this comes nearest to *Lithocosmus*, but the form of the second submarginal and first posterior cells is quite different. The venation is essentially that of *Phthiria* and *Acreotrichus* . . .” The size of *palpalis* alone (Fig. 1) (body length 10 mm, wing length 7.5 mm) should serve to separate it from most *Phthiria*; however, examination of the type specimen and accompanying reverse (which is in a much better condition than the type) revealed that Cockerell had incorrectly illustrated the wing venation. The 2 most obvious errors

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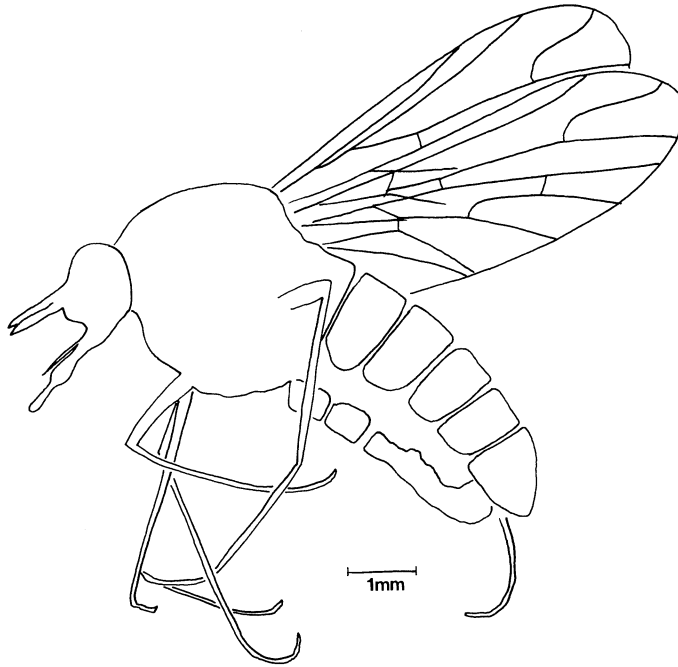


FIG. 1. *Protophthiria palpalis*, reverse of type.

are his interpretation of the shape of the 2nd submarginal cell and the observation that the anal cell is "closed at or almost at margin." The corrected wing venation of *P. palpalis* (Fig. 2) is drawn from the reverse of the type under high magnification. As can be seen, the anal cell is open at the wing margin and not closed as Cockerell had thought. Also, the distal portion of vein  $R_4$  curves upward at the wing margin to a greater degree than in the illustration provided by Cockerell in the original description. These 2 characteristics of wing venation appear to relate *Protophthiria* to *Lithocosmus* (Fig. 4). Other venational characters, such as the length and shape of the vein between the discal and 3rd posterior cells and placement of the r-m crossvein, as well as antennal shape (Fig. 3), length and shape of the proboscis, and general body gestalt all agree with *Lithocosmus*. It is concluded here that the genus *Protophthiria* is a subjective junior synonym of *Lithocosmus*; *Protophthiria palpalis* should thus be transferred to *Lithocosmus*.

One more detail must be dealt with: that of subfamilial placement. *Protophthiria* was placed in the Phthiriinae by Hull (1973), but its true wing venation as shown here precludes it from being a phthiriine by virtue of the open anal cell. Hull (1973) ambiguously placed *Lithocosmus* in the Usiinae (Hull 1973: 59) and in the Cylleniinae (Hull 1973: 65). Comparisons of the descriptions and illustrations of *Lithocosmus coquilletti* Cockerell, *Protophthiria palpalis* Cockerell, and *Amictites regiomontana* Hennig

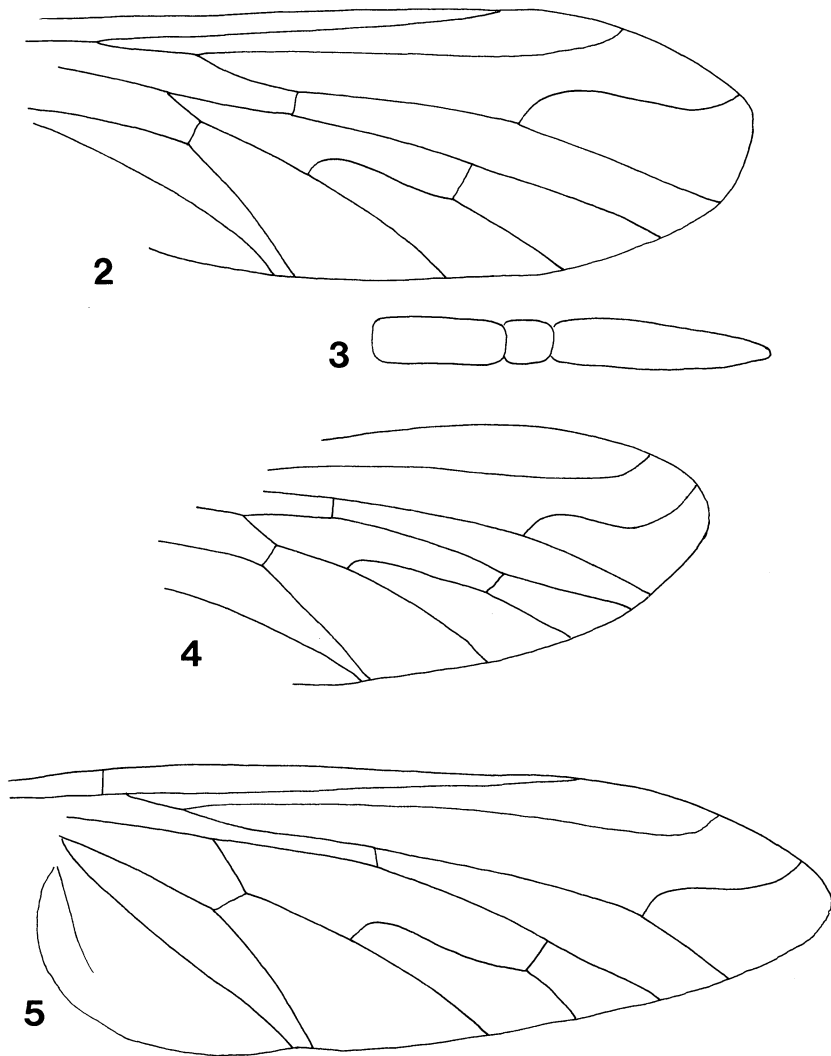


FIG. 2-5. 2-3, *Protophthiria palpalis*: 2, wing; 3, antenna. 4, *Lithocosmus coquilletti*, wing (redrawn after Cockerell 1914a). 5, *Amictites regiomontana*, wing (redrawn after Hennig 1966).

(1966) (Fig. 5) show a great deal of similarity in wing venation, antennal and other characters such as vestiture, shape, etc. *Amictites* is correctly placed in the Cylleniinae, as should be *Lithocosmus* and *Protophthiria*.

Examination of the type of *Protophthiria atra* Melander shows venational characters much the same as originally described, the main exception being that the anal cell is open at the wing margin and not closed as described. Since the venation is signif-

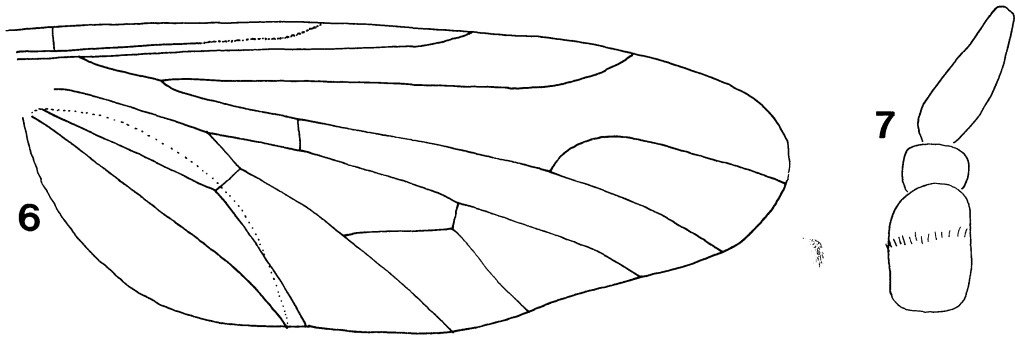


FIG. 6-7. *Protophthiria atra*: 6, wing; 7, antenna.

icantly different from *Lithocosmus palpalis* to warrant separate generic status, the following is proposed.

#### **Tithonomyia** Evenhuis, **new genus**

The venational and antennal characters (Fig. 6-7) should serve to separate this genus from others in the family. The open anal cell precludes it from being placed in the Phthiriinae; however, other venational characters apparently fit closer to Bombyliinae than any other subfamily. Unfortunately, relatively poor state of preservation of the type specimen does not allow more detailed analysis of its generic placement within the Bombyliidae. Even so, comparison of the wing venation in combination with antennal characters with other known living and fossil genera of Bombyliidae reveals that *Tithonomyia* comes closest to bombyliine genera such as *Conophorus* Meigen.

#### **Tithonomyia atra** (Melander), **new combination**

Fig. 6-7

*Protophthiria atra* Melander, 1949: 33.

Holotype (USNM No. 112552), "Lacoe collection, Oligocene [actually Miocene] shale, Florissant, Colorado." The type is preserved with mounting medium and a cover slip. No reverse is known.

My examination of the type under high magnification exposed some discrepancies in Melander's description. Melander (1949) noted the venational differences between *Protophthiria atra* and present-day *Phthiria*, but elected to place *atra* with *Protophthiria*, apparently due to its superficially similar size and shape to *P. palpalis*. The proboscis of *atra* is broken off, contradicting Melander's interpretation that it might be the "pendant" structure below the head. This pendant structure is, in fact, part of the front leg, which Melander queried. The venational characters (Fig. 6) are much the same as Melander described, with the exception that the anal cell is actually open at

the wing margin and not closed as originally described. The axillary lobe is folded over the anal cell of the wing (dotted line in Fig. 6) in the type; this may have misled Melander to interpret "anal cell closed before margin, but short petiolate." The vestiture of the type, though very sparse, is preserved, contrary to Melander's statement that "vestiture, if any, not preserved." Small setulae or hairs can be seen on the lateral and dorsal portions of the 1st antennal segment, vertex, tibiae and tarsi, and posteriorly on some abdominal tergites, including the postabdomen. A basal comb is present on the costal vein. The abdomen is not shorter than in *Protophthiria palpalis*, as stated in the original description, but this may have been an interpretive error due to the orientation of the type specimen in the shale deposit.

*Acknowledgments.* Deepest appreciation is extended to Mr Frederick J. Collier and Mrs Jann Thompson, Department of Paleobiology, United States National Museum of Natural History, Washington, D.C., for allowing me to examine the types of *Protophthiria palpalis* and *P. atra* in their care. Special thanks are also due to Dr F. Martin Brown for supplying me with photographs of the fossil types and subsequently arousing my interest in fossil Bombyliidae.

#### LITERATURE CITED

- Cockerell, T.D.A.** 1909. Fossil insects from Florissant, Colorado. *Bull. Am. Mus. Nat. Hist.* **26**: 67-76.  
1914a. The fossil and recent Bombyliidae compared. *Bull. Am. Mus. Nat. Hist.* **33**: 229-36.  
1914b. New and little-known insects from the Miocene of Florissant, Colorado. *J. Geol.* **22**: 714-24.  
**Hennig, W.** 1966. Bombyliidae im Kopal und im Baltischen Bernstein (Diptera: Brachycera). *Stuttgarter Beitr. Naturkd.* **166**: 1-20.  
**Hull, F.M.** 1973. Bee flies of the world. The genera of the family Bombyliidae. *Bull. U.S. Natl. Mus.* **286**: 1-687.  
**Lewis, S.E.** 1972. A new species of fossil bee fly (Diptera: Bombyliidae) from the Ruby River Basin (Oligocene) of southwestern Montana. *Ann. Entomol. Soc. Am.* **65**: 1421.  
**Melander, A.L.** 1949. A report on some Miocene Diptera from Florissant, Colorado. *Am. Mus. Novit.* **1407**: 1-63.