

REDESCRIPTION OF THE FOSSIL
ORNITHOMYA ROTTENSIS (STATZ)

(Diptera: Hippoboscidae)¹

By T. C. Maa²

Abstract: *Ornithoponus rottensis* Statz, the only known fossil hippoboscid is reassigned to *Ornithomya* and a redescription, based upon the unique type, is given. Its systematic position and affinities to Recent forms are discussed.

Ornithomya rottensis (Statz), n. comb. Figs. 1 & 2

Ornithoponus rottensis Statz, 1940, *Palaeontographica* (A) **91**: 154, pl. 22, fig. 50 (orig. desc.); 1941, *Rheinischer Naturfreund* **5** (1): 12, figs. 16-17 (supplem. notes).

Lynchia rottensis: Bequaert, 1954, *Ent. Amer.*, n. ser. **34**: 39 (transl. of orig. desc., disc. of affinities).—Maa, 1963, *Pac. Ins. Mon.* **6**: 120 (list).

Original description. Since Statz's description was published in a journal not found in most entomological libraries, and for comparison with my redescription, Bequaert's translation, with slight modifications, is quoted below. "This well preserved lousefly is present in both the reverse and obverse, and lies on the venter. Wings spread out backward; legs in normal position on both sides of body. Length of body, 4.2 mm; of wing, 4 mm; greatest width of wing, 1.4 mm. Head rounded, as wide as long, brown, with a few setae. Eyes small, rounded, blackish. No ocelli. Thorax large, roundish, blackish brown, sparsely hairy, with several long bristles. Prothorax [Prescutum] emarginate anteriorly, humeral callus somewhat prominent. Transverse mesonotal suture distinct, rather straight. Scutellum wide, short, rounded posteriorly. Wings well developed, extending far beyond abdomen, narrowly rounded anteriorly. Surface of wing with microtrichia; veins dark brown. Costa straight, finely setose, apparently reaching [apex of] R_{4+5} ; subcosta long, parallel to costa, into which it ends. Radial veins all very strong; R_1 short, reaching costa before midlength of wings; R_{2+3} straight, ending beyond midlength; R_{4+5} straight, ending in anterior margin far from wing-tip. All other veins very weak; M_{1+2} slightly bent down beyond *rm* toward hind margin which it does not reach. Cubital vein evenly, slightly curved, likewise not reaching hind margin. No cubital cell. Legs sparsely setose, pale brown; tarsi somewhat darker. Femora a little thickened, with strong dark setae. Tarsal segments short, last segment thick, with strong bispinose claws. Abdomen blackish brown, about as long as, but narrower than thorax, pointed posteriorly. Pilosity not dense; posteriorly with scattered long setae. Number of seg-

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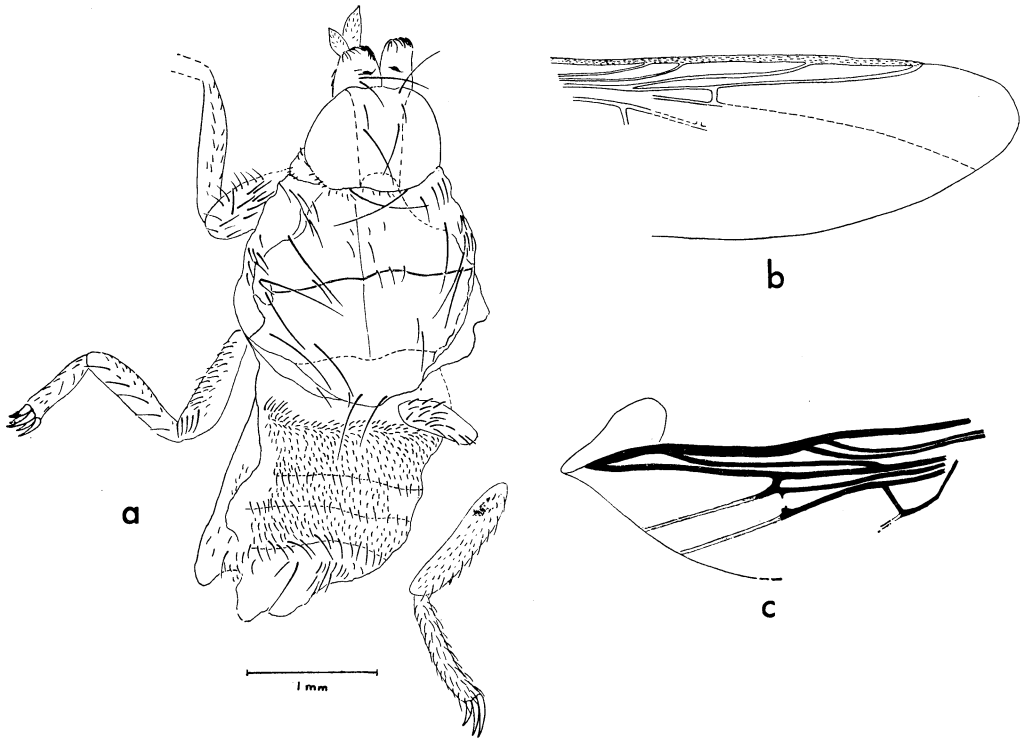


Fig. 1. *Ornithomya rottensis* (Statz), a, dorsal view, drawn from the reverse of the type; b, right wing, drawn from the reverse; c, left wing, drawn from the obverse but upper end of *im* was from the reverse.

ments not clear, apparently 5 or 6 before genital opening". In addition to the description, a drawing of the wing as well as a photograph of the fossil were given in the original description; and, photographs of both reverse and obverse of the fossil, in Statz's (1941) later paper.

Redescription. Body (from antennal to abdominal apex) 3.7 mm long; wing 3.8 mm long, 1.1 mm wide (not as large as described by Statz). Head hardly more than $1/2$ as wide as thorax, roundish and about as long as wide in front view. Postvertex much wider than long (margins not well definable in type); ocelli (?); vertical bristle long, slightly more robust than major thoracic bristles; occipital margin nearly straight. Interocular face slightly narrower than eye in front view of head; inner orbit (probably) narrow; orbital setae fairly long, in single series, 2 of them (1 each at anterior end and at midlength of inner orbit) noticeably longer and more robust than remainder; lunula $ca\ 2.5\times$ as wide as long, anteriorly weakly and posteriorly strongly convexly curved; interantennal area absent (?) or very narrow. Eye large, $ca\ 2.5\times$ as long as wide in front view of head (not "small, round" as described by Statz). Antenna roundish (in front view of head), hardly longer than wide; basal segment clearly defined, transversely

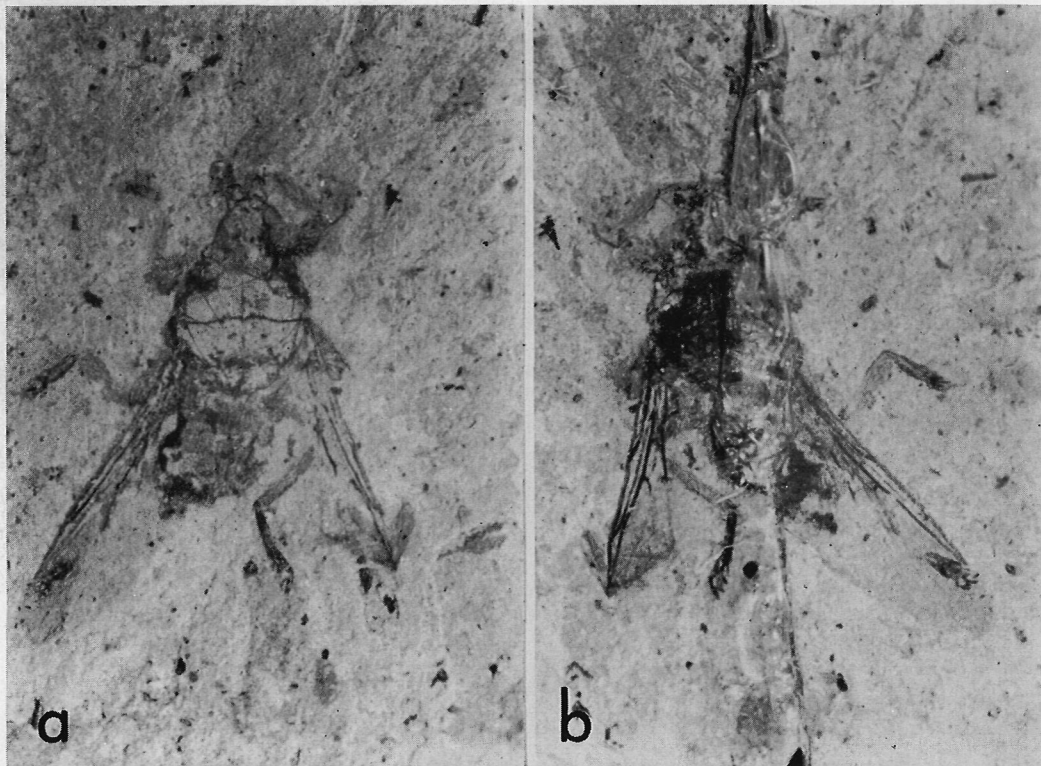


Fig. 2. *Ornithomya rottensis* (Statz), a, reverse of the type; b, obverse of the type.

linear, bearing few short setae; apical $1/2$ of antennal appendage densely covered with setae of varied length. Palpus in lateral view *ca* $1/2$ as wide as antenna, leaf-like, strongly narrowed toward its acute apex, surface evenly sparsely covered with short fine setae, no (?) long apical bristles. Thorax *ca* $4/5$ as long as wide, anteriorly broadly emarginate; median notal suture distinct, bisecting posterior $3/4$ of prescutum and middle $1/3$ of scutum; posthumeral suture about as strong as median notal suture, its posterior $1/3$, *i.e.*, section near anepisternum, poorly definable; transverse mesonotal suture distinct, complete, virtually straight; scutoscutellar suture weaker than above-described sutures, gently curved forward at middle. Major thoracic bristles composed of 1 humeral, 1 notopleural, 1 postalar, 1 posterior dorsocentral and 1 (?) scutellar on each side; all similar to one another in length and robustness except posterior dorsocentral which is only *ca* $2/3$ as long as others. Humeral bristle arising from near center of humeral callus; notopleural, lying almost directly in front of supra-alar; scutellar, lying closely to median line of scutellum and perhaps 2 in number on each side, since the pair clearly visible in the type lying somewhat to left-side and since the sublateral one lying next to right bristle might be interpreted either as a 3rd bristle or a continuation of right posterior dorsocentral (however, there is slight constriction between this presumably 3rd bristle and that dorsocentral). In addition to major bristles, humeral callus and an-

episternum also with several setae of varied length but none of them unusually short, robust and spine-like; anterior margin of prescutum with small transverse patch of dense short setae; median area of prescutum and scutum with a number of sparse setae which are about as long and robust as minor orbital setae; scutellum (probably) lacking setae at anterior part. Humeral callus large, nearly as long as wide, anteriorly strongly protruding; anterior thoracic spiracle (?); scutum slightly shorter than prescutum and slightly longer than scutellum; anepisternum evenly narrow; posterior scutellar margin gently broadly curved. Thoracic venter (?). Wing slightly less than $2\times$ as long as head plus thorax, fairly narrow, hardly more than $2/3$ as wide as thorax, with longitudinal veins largely crowded together near costal margin. Vein C with short series of long setae near base, remaining part all adorned with dense small setae; other veins (probably) bare; Sc rather thin, running very close (probably due to longitudinal folding of that part of wing) to R_1 , with extreme apical section curving toward and meeting C; R_1 as thick as C (basal abscissa) and as R_{4+5} , merging with C apically where the combined vein thus resulting distinctly thicker than all other veins and reaching a point not far from wing-apex; R_{2+3} rather thin, very weakly curved; R_{4+5} long, thick, very weakly curved too. No interruption on C between its meeting points with Sc and R_1 ; relative length of 3 distal abscissae of C as 1 : 5 : 3. Veins M_{1+2} and $Cu+1A$ nearly as thick as R_{2+3} whereas M_{3+4} as thick as R_{4+5} ; these 3 veins all suddenly becoming pale and weak shortly after meeting their respective crossveins; their apices not quite reaching wing-margin; 1st abscissa of M_{1+2} very gently curved S-like, (probably) with bulla. Crossvein *rm* as thick as R_{4+5} , slightly oblique, forming acute interior angle with M_{1+2} ; *im* situated slightly basad to *rm*, with upper $2/3$ pale and hardly definable, lower $1/3$ as thick as R_{2+3} ; *mcu* as thick as R_{2+3} too, strong, gently curved, forming acute interior angle with M_{3+4} ; *rm* lying at a point of basal $5/11$ of wing; furcation of R_s and lower end of *mcu*, at points of same distance from wing-base. Cells *3r* and *1m* almost entirely covered with microtrichia and seemingly darker (*1m* in particular) than other cells; microtrichia in other cells (?); *3bc ca* $2.5\times$ as long as wide, narrowed basad. Leg 1, particularly its femur, distinctly shorter and more robust in proportion than 2 and 3; femur 1 with irregularly arranged bristles much more robust and more numerous than on femora 2 and 3; tibia 1 almost as long as 2 but markedly shorter than 3; apical spurs on tibiae 1 and 2 (?); tibia 3 uniformly slender, not distinctly compressed, not thickened apicad as in 1 and 2, its inner surface with a complete longitudinal series of short sensory setae, apically with no less than 3 spurs; ventral surface (plantar) of tarsi 1 and 2 with only few fine and very fine setae; ventral surface of tarsus 3 with a number of strong spine-like setae in addition to dense ordinary ones; tarsal claws deeply bifid, upper tooth longer than lower, and both slender, pointed and weakly curved in profile; basal "heel" of claws (?). Abdominal dorsum densely, almost uniformly covered with short setae, apparently of 5 segments which are all weakly sclerotized; syntergite 1+2 more densely and (particularly at lateral area) more strongly setose than following tergites, its posterior margin virtually straight; tergites 3 to 5 much wider than head, definable from one another only by very narrow transverse bare strips and a row of slightly stronger setae lying immediately before each strip; setae of hindmost row for tergite 5 in part much longer and stronger than elsewhere at discal area; setae on tergite 6 (or its side-pieces) still longer and more robust than that on syntergite 1+2 and tergite 5. Abdominal apex

(? ♂ terminalia) bearing some minute setae and perhaps due to outside pressure, somewhat pointed and exerted. Abdominal venter (?). Sex of type undeterminable.

Type. The unique type is now in the Los Angeles County Museum and is composed of both the reverse and obverse. The reverse is entire whereas the obverse, in 3 pieces held together with some sort of transparent glue. The glue has been applied too extensively and it makes some of the characters difficult for examination. The insect lies on the venter. Its left wing is transversely folded near the apex, and the tibia and tarsus of left midleg, concealed underneath, otherwise the entire insect is well spread. The type apparently has not been re-examined by recent workers in Hippoboscidae.

Habitats. This species is known only from the type which was discovered in the Upper Oligocene shales (Aquitanian) of Rott, Siebengebirge, Rheinland, Germany. It is almost certainly a parasite of birds but upon which kind of bird did this fly live remains a question (Bequaert, *l. c.*). Statz's (1940:168) surmise seems questionable that swamps with wading birds possibly existed at Rott during the Oligocene and that this fly might have lived upon them. Evidences against this surmise is that Recent species of *Ornithomya* are largely polyxenous and none of them confines itself to wading birds. Strict host specificity probably resulted from more recent evolution and therefore may not have occurred in archaic forms.

Systematics. As indicated in the bibliography, this species was originally placed under *Ornithoponus*³, a generic name quite uncommonly used in papers on Hippoboscidae. Hence it seems reasonably safe to presume that Statz employed this name after referring to Aldrich's (1923, *Insecutor Inscitiae Menstruus* 11: 75-78) key to hippoboscid genera of the world. In that key, *Ornithoponus* was separated from other genera by "Wings flat or with very faint rills, functional, with 5 or 6 distinct veins behind costa; 2 crossveins, 2nd crossvein far before 1st; anal cell not closed by crossvein; ocelli absent; claws tridentate; clypeus very short, anteriorly widely rounded and leaving base of proboscis exposed, no horn-like projecting arms; lateral lobe of metanotum not bearing a process." Statz did not describe the clypeus and lateral metanotal lobe and apparently he referred the fly to *Ornithoponus* on the basis of venational characters and the presumed absence of ocelli. I am not quite sure about the absence of ocelli in the type. On the left wing there are clearly 3 crossveins and the 1st and 2nd lie very close to each other.

This venational character alone would rule out inclusion of this fossil species in that genus. Perhaps Statz overlooked the true 2nd crossvein (which is largely pale and very weak), mistook the 3rd crossvein, or the slightly darkened anterior margin of the overlapped left hind femur, as the 2nd crossvein. Besides the venation, certain other characters in *rottensis* do not fit well with that genus. They are: Interantennal area very narrow; 1st antennal segment transversely linear, not triangular and switched mesad; palpus with only short fine setae; mesonotum with fairly long setae at median area but lacking oblique anterolateral setal patch on prescutum; prescutum only slightly

3. *Ornithoponus* Aldrich 1923 is a synonym of *Lynchia* sensu Bequaert 1926 (not *Lynchia* Weyenberg 1881) and of *Icosta* Speiser 1905.

longer than scutum; anepisternum narrow; scutellum large, with distinctly convex anterior margin and with distinctly submedian, not lateral, preapical bristles (only in 1 anomalous *Icosta* species, these bristles are likewise submedian); femur 1 with bristles not arranged in 1 transverse and 1 longitudinal series on anterior (interior) and dorsal surfaces respectively; tibia 3 not distinctly compressed and not distinctly narrowed basad; abdominal dorsum uniformly densely setose, without largely or entirely bare striolate area at middle.

Insofar as is observable or conjecturable from the unique specimen and comparison with Recent hippoboscids, the most significant character of *rottensis* appears to be the nature of the antennal and basal venational articulation. The 1st antennal segment is very well defined, transversely linear, not triangular and switched mesad though the same segment of the 2 antennae are not quite close to each other; the 2nd segment (including its "appendage") is large, roundish, with inner margin of left antenna in close contact with that of right antenna, which probably results in the fusion of left and right antennal pits and the disappearance or reduction of interantennal area. A similar phenomenon is found in Recent *Ornithoica* where the 2 antennae are in close contact along the inner margins of their 1st (not 2nd) segments, which are large and longitudinal, whereas the 2nd segments are well separated from each other. There is no sign of any distortion in the head of the type. It is not entirely impossible that the contact of the 2 antennae of *rottensis* might have resulted from outside pressure during or before its fossilization, since the palpi in the type are somewhat displaced to the right-hand side. The nature of basal branching of the 3 posterior veins in the right wing is not clear. In the left wing, there seems to be an oblique vein-chord apically running into Cu+1A, whereas M₁₊₂ and M₃₊₄ seem to arise both directly from that chord. If this proves to be true, it would mean the absence of the M-stem which is quite distinct though often short in *Ornithomya* and several other hippoboscid genera. Unfortunately the state of preservation of the type does not convince me whether or not this supposed vein-chord does exist. The presence or absence of ocelli in *rottensis* is not important since it is by no means a good generic character in hippoboscids. The basal "heel" of tarsal claws are not clearly definable in the type, but the narrow and pointed lower tooth strongly suggests the presence of such a structure.

Although the basal articulation of the antenna (and perhaps that of the M-branches too), as described above, is different, *rottensis* clearly falls into *Ornithomya* Latreille 1802 in the current classificatory system of Hippoboscidae. The venation, even including the relative density of microtrichia in cells *3r* and *1m*, in *rottensis* and Recent *Ornithomya* species is so surprisingly similar that it leaves no doubt regarding their close affinities. The presence of setae on the median mesonotal area, the narrower wing and the proximity of cell *2r* to wing-apex do mark the distinction between the fossil and Recent forms, but it would be going too far to establish an independent genus for the reception of the fossil. In my earlier paper on the natural groupings of the Hippoboscidae, the 10 Recent species of *Ornithomya* then recognized were allotted to 3 species-groups, typified by *avicularia* Linnaeus 1758, *ambigua* Lutz 1915 and *biloba* Dufour 1827 respectively. To these, *rottensis* forms a 4th species-group which stands next to the *avicularia* group.

Among Recent Hippoboscidae, the genus *Ornithoica* Rondani is generally considered to be the most generalized. It differs from *rottensis* in having the antenna articulated otherwise (as described above), palpus in profile almost uniformly broad and apically blunt, thoracic dorsum with more numerous setae and bristles, humeral callus and anepisternum with spine-like modified setae, median notal suture absent, transverse meso-notal suture broadly interrupted at middle, humeral callus more weakly developed, wing broader in proportion, vein C terminating far before wing-apex and not much thickened after meeting R_1 , apical 1/2 of R_{4+5} almost confluent with C, crossvein *im* lying not quite closely to *rm*, apical spurs or spines on tibia 3 more numerous, tarsal claws simple, abdominal tergal plates not or hardly wider than head, syntergite 1+2 distinctly produced posterolaterally. These differences clearly show that both *Ornithoica* and *rottensis* have deviated long ago from the hypothetical Proto-Hippoboscidae. The leaf-like palpus, largely bare thoracic dorsum, well developed humeral callus, narrow wing and thickened vein C after meeting R_1 in *rottensis* are characters apparently more specialized than in *Ornithoica*, although it had otherwise more important generalized characters. Therefore in all probability, the Hippoboscidae have diversified in several directions not later than the Oligocene era, and as suggested by Bequaert (1954: 41), "Primitive higher muscoid flies, of types that might have given rise to the ancestral Proto-Hippoboscidae, were already fairly abundant during Cretaceous times, if not earlier."

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