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On the identity of *Colletes neoqueenensis* (Colletidae: Colletinae) from southern South America

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Abstract. *Colletes neoqueenensis* Friese, 1910 is a rare species from southern Argentina known to me from its type series only. The species has also been recorded from Chile, but its occurrence in that country remains to be confirmed. Examination of some museum specimens misidentified as *C. neoqueenensis* indicates that bee taxonomists are often unaware of its actual identity. To clarify this, I provide a series of diagnostic characters as well as a detailed redescription of the female lectotype. High quality photographs of the type specimen are also given so the species can be more easily identified.

INTRODUCTION

Colletes neoqueenensis Friese, 1910 (Colletidae: Colletinae) was described from several females collected in the provinces of Neuquén and Mendoza, Argentina, by A. Lendl and P. Jörgensen, respectively (Friese, 1910). Nearly one century later, Moure studied the type series and designated a female from Neuquén as the lectotype (Moure & Urban, 2002). Regrettably, the male of *C. neoqueenensis* has never been described.

In the preliminary list of the bees of Chile, Toro (1986) recorded *C. neoqueenensis* from the southern region of the country (free translation from the Spanish “Zona Sur”), which represented the first record of the species out of Argentina. Later, the same author elaborated a synopsis of the species of *Colletes* Latreille occurring in Chile wherein he confirmed the occurrence of *C. neoqueenensis* in Region XI of that country (Toro, 1999). More recently, the species has been reported from as far north as Region IV in Chile (Montalva & Ruz, 2010). However, I recently revised the Chilean fauna of *Colletes* and the occurrence of *C. neoqueenensis* in that country could not be confirmed (Ferrari, 2017). Moreover, none of the specimens known to me that had previously been identified as *C. neoqueenensis* by other bee taxonomists matched the female lectotype. Therefore, the identity of *C. neoqueenensis* remains equivocal and, to clarify this

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issue, I herein redescribe and illustrate the female lectotype. I also provide a comparative diagnosis to help distinguish *C. neoqueenensis* from its most similar congeneric allies in southern South America.

MATERIAL AND METHODS

The bees were studied under an Olympus SZ61 stereomicroscope with a Neewer Ring48 LED ring light, and photographed by taking multiple images through a focal range with a Visionary Digital BK Plus system, using a Canon 5D Mark II camera with a Canon 65mm lens. Image slices were amalgamated to produce a single image using Helicon Focus. Final images were edited, and amalgamated into plates, in Adobe Photoshop.

Terminology for bee morphology is that of Michener (2007), with the following exceptions: (i) the basal and posterior surfaces of metapostnotum are referred to as horizontal and vertical surfaces of metapostnotum, respectively; (ii) gena, frons, and vertex are called genal, frontal, and vertexal areas, respectively; and (iii) 'pretarsal claws' is used rather than 'tarsal claws'. Terminology for surface sculpture follows that of Harris (1979), and for leg surfaces follows that of Aguiar & Gibson (2010). Metasomal terga and sterna, and antennal flagellomeres are abbreviated as T, S, and F, respectively, followed by appropriate numbers. Puncture spacing is given in terms of the relative sizes of the interspaces (I) and puncture diameters (D). Pubescence length (L) is compared to the diameter of the median ocellus (MOD).

The following collections are referred to in this paper: American Museum of Natural History, New York, USA (AMNH); Division of Entomology, University of Kansas, Lawrence, USA (SEMC); Museum Nacional de Historia Natural, Santiago, Chile (MNHN); Museum für Naturkunde, Humboldt-Universität zu Berlin, Berlin, Germany (ZMB); and Pontificia Universidad Católica de Valparaíso, Valparaíso, Chile (PUCV).

SYSTEMATICS

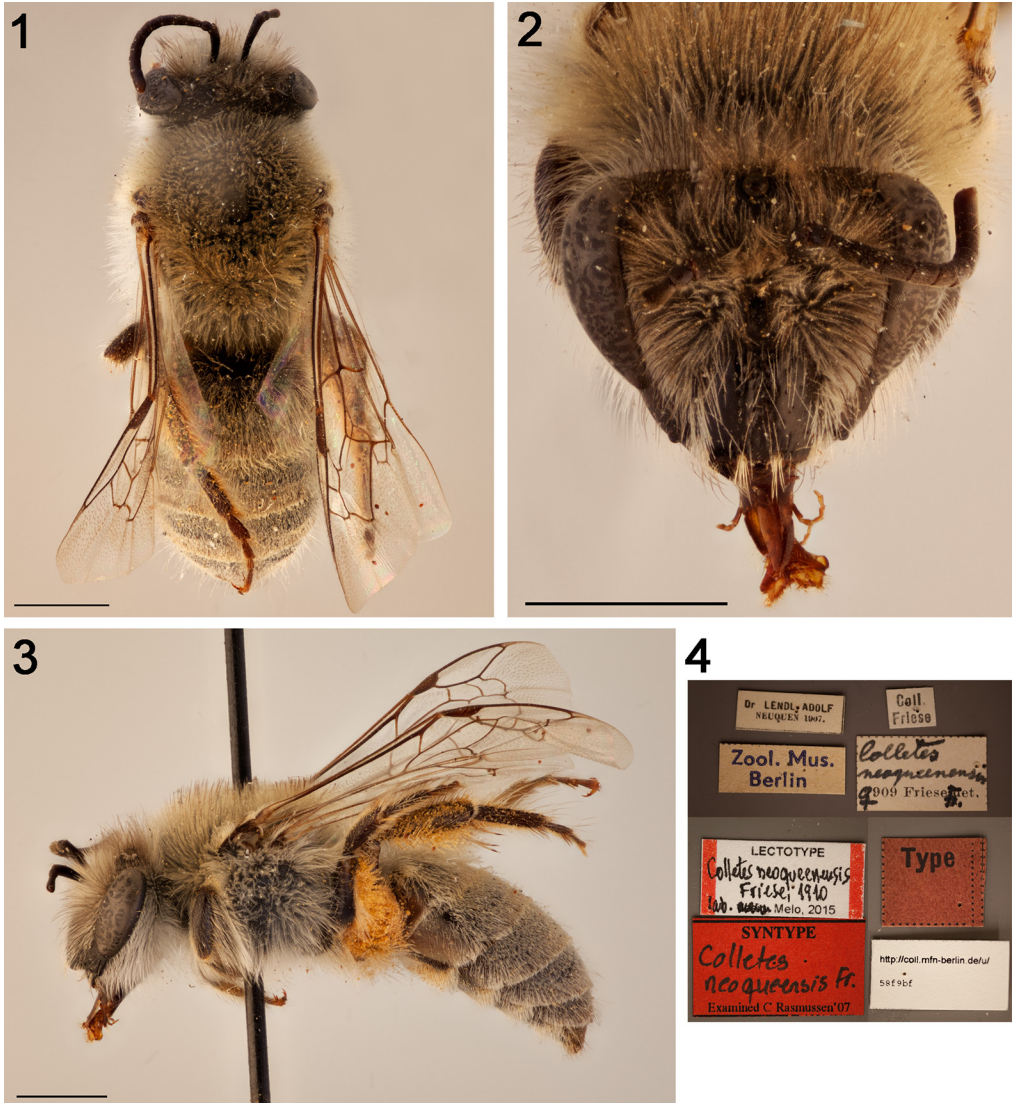
Family Colletidae Lepeletier
Subfamily Colletinae Lepeletier
Tribe Colletini Lepeletier
Genus *Colletes* Latreille

Colletes neoqueenensis Friese, 1910
(Figs. 1–4)

Colletes neoqueenensis Friese, 1910: 649. Lectotype ♀ (examined), designated by Moure & Urban (2002: 15) and deposited at ZMB.

Colletes neuqueenensis [sic]; Moure & Urban, 2002: 15; Montalva & Ruz, 2010: 22.

LITERATURE: Friese (1910: 649): comparative note (*C. araucariae* Friese, 1910); Friese (1912: 367): key (female); Toro (1986: 123): distribution (southern Chile); Toro (1999: 26, 30): key (female), note on type specimen (depository), distribution (Region XI, Chile); Moure & Urban (2002: 15): lectotype designation (as *C. neuqueenensis*); Montalva & Ruz (2010: 22): distribution (Regions IV–IX, Chile and Mendoza and Neuquén, Argentina) (as *C. neuqueenensis*); Ascher & Pickering (2018): distribution (Region XI, Chile and Neuquén, Argentina); Ferrari (2017: 126): key (female).



Figures 1–4. Female lectotype of *Colletes neoqueenensis* Friese. **1.** Habitus, dorsal view. **2.** Face, frontal view. **3.** Habitus, lateral view. **4.** Labels. Scale bars = 2mm.

DIAGNOSIS: The female of *C. neoqueenensis* (the male remains unknown) can be diagnosed through the combination of the following features: clypeal mid-longitudinal area flat and not depressed; mesoscutum with pale-yellow and fuscous hairs intermixed; mesepisternum with imbricate interspaces; and metasomal terga black, covered with pale-yellow, dense tomentum. *Colletes neoqueenensis* is most similar to *C. longiceps* Friese, 1910, but the clypeal mid-longitudinal area is densely punctate ($I=0.5-1D$) in the former [sparsely punctate ($I=1.5-2D$) in the latter]. In addition, the paraocular area is covered with mixed pale-yellow black hairs in *C. neoqueenensis* (paraocular area with only pale-yellow hairs in *C. longiceps*). *Colletes neoqueenensis* is also very similar to *C. toroi* Ferrari, 2017, but they can be differentiated by mesoscutum with pale-yellow and fuscous hairs intermixed in the former (mesoscutum with only pale-yellow hairs

in the latter); and by mesepisternum with imbricate interspaces in *C. neoqueenensis* (interspaces smooth in *C. toroi*).

REDESCRIPTION: ♀: Approximate body length 9.7 mm, head width 3.3 mm, head length 2.5 mm, intertegular distance 2.8 mm, forewing length 7.7 mm.

Coloration: Black except dark-brown on ventral surface of flagellum (except proximal 1/3 of F1 black), tegula, vein R of forewing, posterior margin of pterostigma, anteroventral surfaces of front and mid tibiae, dorsal surfaces of basitarsi and tarsomeres 2–3, ventrally reflexed areas of T1–T2, S2 laterally, S6 mid-longitudinally. Pale-brown on wing veins (except vein R of forewing dark-brown), distal halves of pretarsal claws, dorsal surfaces of tarsomeres 3 and distitarsi, marginal zones of T1–T5. Reddish-brown on distal 1/3 of mandible. Tibial spurs and marginal zones of S1–S5 pale-yellow.

Structure: Labrum medially concave; concavity margined by lateral ridges. Clypeal mid-longitudinal area slightly concave. Malar area $\sim 1.1\times$ as long as basal depth of mandible (58:52). F1 $1.5\times$ as long as its apical width (27:18). Ratio between upper and lower interocular distances ~ 1.1 (67:60). Genal area concave behind upper summit of compound eyes in lateral view. Anterolateral angle of pronotum rounded. Horizontal surface of metapostnotum about half as long as metanotum (26:50). Posteromedial surface of front coxa without spine. Posterior hind tibial spur pectinate. Hind basitarsus $\sim 2.6\times$ longer than broad (45:17). Outer rami of hind pretarsal claws $1.5\times$ as long as inner rami (12:8). Posterolateral area of S6 flat; marginal zone depressed.

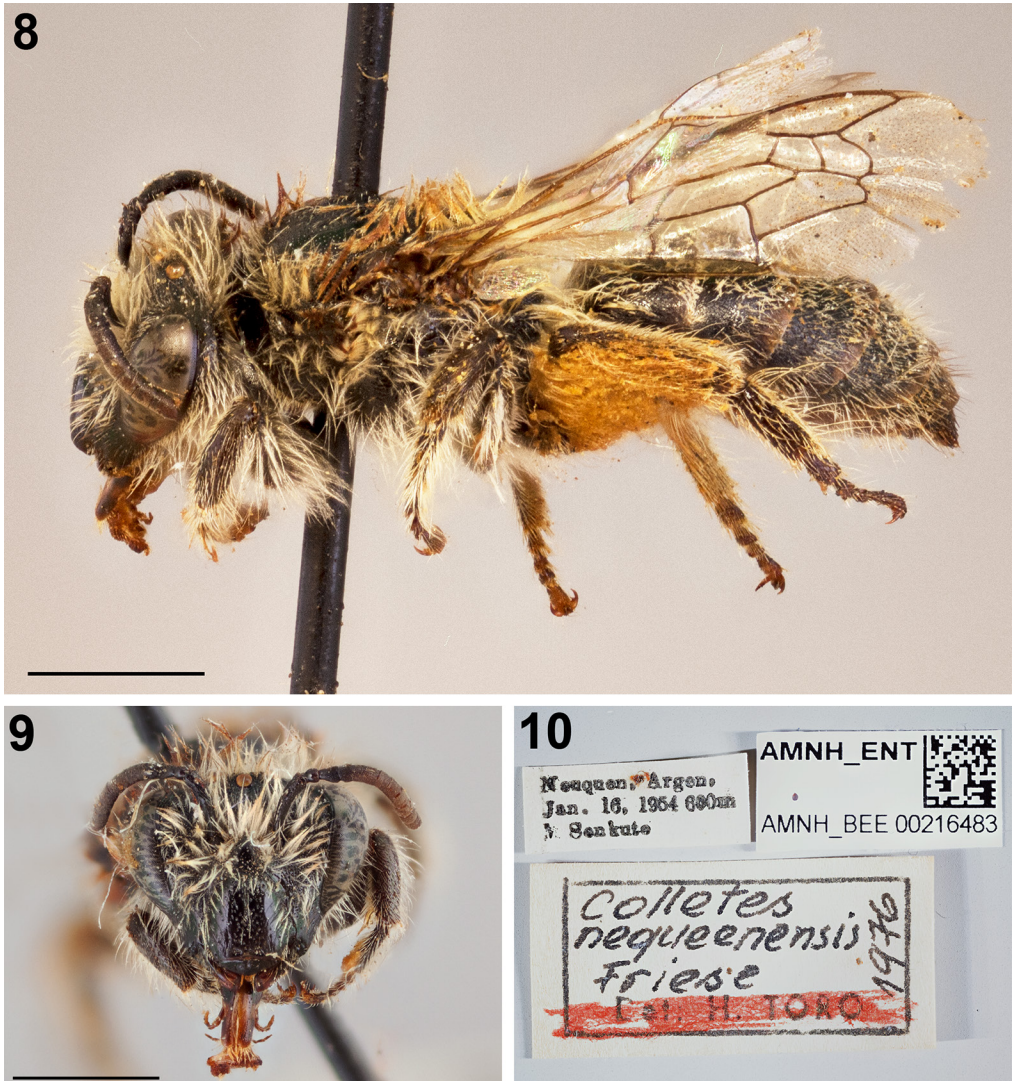
Pubescence: Predominantly pale-yellow, except when stated otherwise. Head with plumose, erect, moderately long ($L=1.5-2\times MOD$) hairs; suberect on clypeal lateral slopes and very long ($L>3\times MOD$) on genal (near proboscis fossa) and vertexal (near occipital area) areas; interantennal and frontal areas with pale-yellow and fuscous hairs intermingled; mandible and clypeal subapical pits with short setae. Mesosoma with plumose, erect, long ($L=2.5-3\times MOD$) hairs; moderately long ($L=1.5-2\times MOD$) on pronotal lobe, very long ($L>3\times MOD$) on mesepisternum and metanotum; mesoscutum with pale-yellow and fuscous hairs intermingled; scutellum with some fuscous tipped hairs; lateral surface of propodeum with suberect, very short ($L<MOD$) hairs. Legs, scopa excepted, with suberect, short ($L=1-1.5\times MOD$) setae; those setae very long ($L>3\times MOD$) on posterior margin of mid and hind tarsi; posterior margin of front tarsus with fuscous setae; ventral surface of mid and hind basitarsi with pale-brown thick setae (thickest towards distal margin); anterior surface of hind femur and tibia with suberect, long, hairs branched only apically. T1–T4 covered with dense, appressed hairs; T1 with erect, long ($L=2.5-3\times MOD$) hairs among appressed hairs; T2–T5 also with erect setae laterally, shortest ($L=1-1.5\times MOD$) on T2, longest ($L=2-2.5\times MOD$) on T4–T5. Disc of T5 with suberect, short ($L=1-1.5\times MOD$) setae; discal setae thick on T6. S1 with erect, plumose, moderately long ($L=1.5-2\times MOD$) hairs. Disc of S2 with erect, very short ($L<MOD$), hairs branched only apically. Disc of S2–S6 with suberect, very short ($L<MOD$) setae; marginal zones with plumose hairs (except for S6).

Surface sculpture: Clypeal mid-longitudinal area densely ($I=0.5-1D$) and moderately finely punctate (interspaces imbricate); adjacent convex area largely inpunctate and smooth. Malar area substrigulate on disc; crowded punctate on lateral slopes. Supraclypeal area imbricate. Paraocular area moderately coarsely punctate; crowded below; only moderately densely ($I=1-1.5D$) punctate above; interspaces imbricate throughout. Frontal area rugose. Vertexal area with minute and moderately fine punctures intermingled; interspaces rugulose (except rugose near lateral ocellus and occipital area). Mesoscutum and scutellum coarsely and densely ($I<D$) punctate (except crowded punctate towards posterior half of scutellum); interspaces smooth (except imbricate towards posterior



Figures 5–7. Female specimen of *Colletes lycii* Jörgensen from SEMC misidentified as *C. neoqueenensis* Friese. 5. Habitus, lateral view. 6. Face, frontal view. 7. Labels. Scale bars = 2mm.

margin of mesoscutum). Metanotum crowded punctate. Mesepisternum densely ($I < D$) and very coarsely punctate; interspaces imbricate. Metepisternum rugose above and medially; coarsely and densely ($I < D$) punctate below. Lateral surface of propodeum moderately densely ($I = 1-1.5D$) and moderately finely punctate; interspaces imbricate. Horizontal surface of metapostnotum strigate. Upper area of vertical surface of metapostnotum rugose. T1 finely and sparsely ($I = 2-3D$) punctate; T2–T6 and S2–S5 minutely punctate; interspaces imbricate throughout. S6 sparsely and moderately finely punctate; interspaces imbricate.



Figures 8–10. Female specimen of *Colletes lycii* Jörgensen from AMNH misidentified as *C. nequeenensis* Friese. 8. Habitus, lateral view. 9. Face, frontal view. 10. Labels. Scale bars = 2mm.

♂: Unknown.

LECTOTYPE: ♀, Argentina, Neuquén, 1907, Lendl Adolf coll. Lectotype (Figs. 1–4) designated by Moure & Urban (2002: 649) and deposited at the ZMB.

RANGE: Argentina (Mendoza, Neuquén). Also listed for Chile (Regions IV and XI), but see “Discussion”, below.

COMMENTS: *Colletes nequeenensis* is an uncommon species only known to me by its female lectotype, which is in very good condition. In the original description, Friese compared *C. nequeenensis* with *C. araucariae* Friese, 1910 (= *C. sulcatus* Vachal, 1909), however, the former species is most similar to *C. longiceps* and *C. toroi* (see “Diagnosis”, above). From *C. sulcatus*, *C. nequeenensis* can be easily differentiated by mesepisternum with imbricate interspaces (interspaces smooth in *C. sulcatus*), and posterior hind tibial spur pectinate (spur ciliate in *C. sulcatus*).

DISCUSSION

Colletes neoqueenensis was originally described from a series of females collected in southwestern Argentina (Friese, 1912: 642, 649); later, the species was supposedly found in southern Chile (Toro, 1986, 1999). Since then, the occurrence of *C. neoqueenensis* in Chile has been acknowledged by other authors (e.g., Montalva & Ruz, 2010; Ascher & Pickering, 2018). However, I have recently revised the species of *Colletes* found in Chile (Ferrari, 2017) and none of the examined specimens actually matched the female lectotype of *C. neoqueenensis*, which explains the reason why this species was not formally treated in that paper (although the female can be identified with the key provided there). Unfortunately, all attempts to locate any specimen of *C. neoqueenensis* from Chile that Toro supposedly had access to, and identified as such, failed [L. Ruz (PUCV) and M. Donoso (MNHN), pers. comm.]. Thus, the occurrence of this species in Chile remains to be confirmed.

In fact, one specimen from Argentina borrowed from the SEMC for the purpose of my revision of the Chilean *Colletes* was misidentified as *C. neoqueenensis* (Figs. 5–7). A careful analysis of the identifier's handwriting revealed that it had been identified by J.S. Moure (G. Melo, pers. comm.). It is not clear, however, whether Moure had access to the SEMC specimen before or after studying (and designating) the lectotype of *C. neoqueenensis*. I have also examined another specimen from Argentina deposited at the AMNH which had also been misidentified as *C. neoqueenensis*, this time by H. Toro (Figs. 8–10). Both specimens actually belong to *C. lycii* Jörgensen, 1912, identification of which was made by running them through the keys of Friese (1910, 1912) and by comparing them with the original description (Jörgensen, 1912: 96). *Colletes neoqueenensis* and *C. lycii* can be differentiated from each other by: mesoscutum with pale-yellow and fuscous hairs intermingled in *C. neoqueenensis* (mesoscutum with only pale-yellow hairs in *C. lycii*); and posterior hind tibial spur pectinate in *C. neoqueenensis* (spur ciliate in *C. lycii*).

Therefore, the series of misidentifications involving *C. neoqueenensis* reported in this paper reveals that the actual identity of this species has been equivocal up to present. Hopefully, *C. neoqueenensis* will be more easily identified from now on with the redescription, diagnosis, and illustrations provided in this paper.

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