Biogeography of Chilean bees in the Atacama Desert: with a focus on the boundary between summer and winter rainfall regions

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ABSTRACT

There are two rainfall regimes in northern Chile where the majority of rain in the northeast occurs during the austral summer while the southwest receives rain mainly during the austral winter. The transition zone between these two rainfall regimes may have influenced speciation events in northern Chile by serving as a barrier to dispersal. This study tests for disjunct sister groups in the bee genera *Neofidelia* (Megachilidae), *Callonychium* (Andrenidae), and *Caenohalictus* (Halictidae) using the Spatial Analysis Vicariance method. Phylogenetic trees were constructed with mtDNA CO1 sequences for *Callonychium* and *Caenohalictus* and a combination of morphological and molecular data for *Neofidelia*. The Vicariance Inference Program returned a total of 4 disjunct nodes among the three genera with sister taxa residing on either side of the summer/winter rainfall transition zone in each of them. I conclude that the transition zone between summer/winter rainfall acts as a barrier to dispersal in northern Chile.

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CHAPTER 1

INTRODUCTION TO BIOGEOGRAPHY

Biogeography is the study of the geographic distribution of plants and animals in space and time (Watts, 1971; Pielou, 1979; Riddle and Hafner, 2004). This is a very broad descriptive field, and because of this almost any naturalist in the 19th century could be considered to have contributed to the field of biogeography.

Alexander von Humbolt studied the geography of plants in the early 19th century and his work served as a template for future work in biogeography (Pielou, 1979). Agustin de Candolle, as discussed below, was the first to make a distinction between two broad sub-divisions of biogeography; ecological and historical biogeography (Crisci *et al.*, 2003). In 1858 Philip Sclater was the first to divide the world into 6 zoological zones (Palearctic, Nearctic, Neotropical, Oriental, Ethiopian, and Australasian) (Pielou, 1979). Some of these zoological zones were subsequently renamed, such as Oriental to Indomalaya and Ethiopian to Afrotropical, and at least two more were added later (Oceanic and Antarctic). Alfred Wallace, often considered the father of biogeography, extensively studied the geographic relationships of plants and animals in the late 19th century and has a biogeographic boundary named after him (Pielou, 1979; Fichman, 2004).

Biogeography often relies on an understanding of the relative roles of vicariance and dispersal in shaping species' distributions. Dispersal occurs when a species' ancestor crosses an existing barrier, becoming isolated from its ancestral distribution, and speciation occurs on either side (Figure 1A; Zink *et al.*, 2000). While vicariance occurs when a new barrier forms and divides a large ancestral range leading to speciation on either side of the barrier (Figure 1B; Zink *et al.*, 2000). Both vicariance and dispersal result in allopatric speciation.

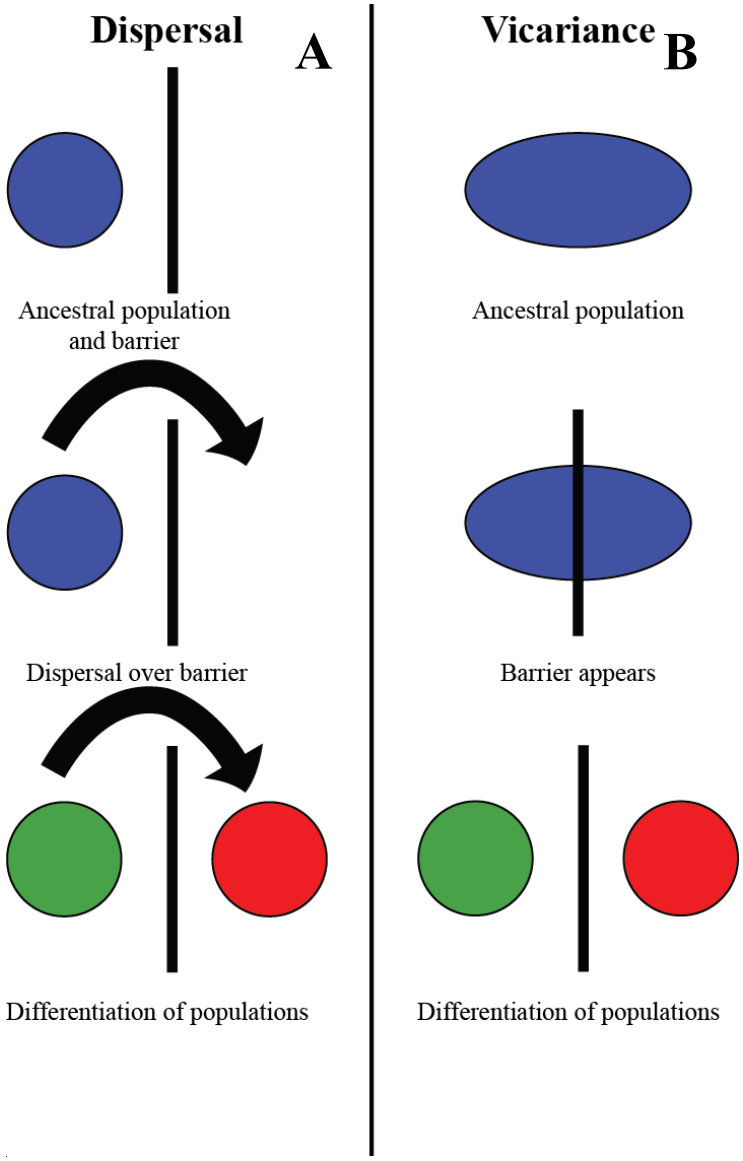

Figure 1: Diagram depicting the difference between dispersal (A) and vicariance (B) as described by Zink *et al.* (2000).

Biogeography is a broad integrated field where multiple scientific disciplines come into play in various combinations (Watts, 1971; Pielou, 1979; Riddle and Hafner, 2004; Rosenzweig, 2004; Morrone, 2009). Almost all fields of biology can be used in the study of biogeography, including but not limited to: ecology, botany, zoology, evolution, conservation biology, palaeontology, population biology, and the list goes on. Aside from biology, other fields must

also be considered such as geology, geography, and climatology to name a few. Due to the broad scope of disciplines available for work in biogeography, cited as "one of the most synthetic of biological undertakings" (Tiffney, 2008), various sub-divisions are often needed to break down this large field of study (Morrone, 2009).

As described by de Candolle in 1820 there are two main sub-divisions of biogeography, ecological biogeography and historical biogeography (Crisci, 2003). Ecological biogeography relies on present (since last glaciation) ecological processes to describe the current distribution of a species or other taxonomic groups, often on a small spatial scale (Crisci, 2003; Morrone, 2009). Historical biogeography is based on past events and processes which have affected the past and current distribution of organisms, typically on a large spatial scale (Crisci, 2003; Morrone, 2009). However, these two broad sub-divisions are not mutually exclusive and biogeographic studies often fall in between historical and ecological biogeography (Morrone, 2009).

Vicariance biogeography attempts to identify the event(s) that have caused multiple speciation events in different taxonomic groups (Hovenkamp, 2001). There are two major approaches to vicariance biogeography, often used in combination (Morrone, 2006); panbiogeography and cladistic biogeography. Panbiogeography, coined by Croizat (for historical account see Hull (1988)), draws lines (termed "tracks") on maps between disjunct localities of related taxa and looks for coincidence of these lines between unrelated groups (Crisci *et al.*, 2003; Morrone, 2006). When individual tracks from unrelated taxa occupy the same area, these are described as summary lines (also termed generalized tracks) (Morrone, 2006). These summary lines recreate ancestral areas that were fragmented by, for example, the movement of tectonic plates and/or changes in climate (Morrone, 2006).

Cladistic biogeography focuses on the hierarchical relationship between areas of endemism utilizing area cladograms (Zink *et al.*, 2000); Crisci *et al*., 2003; Morrone, 2006, 2009, 2014). Area cladograms are used to determine the hierarchical relationship among areas of endemism in an attempt to understand current species distributions and diversity in terms of earth history (Zink *et al.*, 2000; Morrone, 2006, 2014; Arias *et al.*, 2011). Area cladograms are created by replacing taxa on a phylogeny with areas where each of the taxa reside (Morrone, 2014). This assumes a large ancestral range that was divided repeatedly, which recreates a sequence of vicariance events that explains present day diversity and distributions across a geographic area, (Morrone, 2014).

In contrast to examining the relationships among the biota found in, sometimes arbitrary, predefined areas, Hovenkamp (1997, 2001) argued that vicariance biogeography should focus on barriers to dispersal. By looking at the current distributions of extant taxa, given a phylogeny, we are able to determine if a vicariant event (either dispersal or vicariance) had occurred and at which node(s) on the phylogeny that event occurred.

Hovenkamp (1997) makes a distinction between traceable vicariance events (TVEs) and supported vicariance events (SVEs). Vicariance events found on a single cladogram are referred to as TVEs. If the same TVE is found independently on more than one cladogram and the species distributions show overlap on either side of a proposed barrier to dispersal, those TVEs can be combined to create an SVE. In other words, the more times a TVE is found among different taxonomic groups, the more likely that we are looking at a true vicariance event and by extension the origin of a true biogeographic barrier.

Based on the work of Hovenkamp, Arias *et al.* (2011) proposed the Spatial Analysis of Vicariance (SAV) method implemented in the Vicariance Inference Program (VIP) (Arias,

2010). VIP was not meant to distinguish between vicariance and dispersal, but to only state if a disjunction between sister groups exists and to suggest the approximate location of a barrier to dispersal (Arias *et al.*, 2011). Although VIP draws a median line between the two disjunct distribution the barrier to dispersal can lie anywhere in the disjunction. Both SAV and VIP allow for back-dispersal across biogeographic barriers instead of a hierarchy among pre-defined areas. A dispersal event can confound the results of a VIP analysis by obscuring potential disjunct distributions between sister groups (Arias *et al.*, 2011). As seen in Figure 2, the distributions of [C + D] obscure the disjunction between species A and B. If a disjunction is found after the removal of a descendant clade's distribution (Figure 2B), dispersal is implied, but not guaranteed. Distribution removal is meant to maximize the number of disjunctions in an analysis (Arias *et al.*, 2011). If the same number of disjunctions can be found without distribution removal in VIP that analysis is preferred (Arias *et al.,* 2011).

Following a VIP analysis, it is the responsibility of the user to determine a biological explanation of the results. However, the taxon history illustrated in Figure 2 suggests that an event (either vicariance or dispersal) occurred at the node between species A and B (Figure 2B), as well as a dispersal event across the same barrier between B and [C + D] (Figure 2A). If the disjunction at the node between A and B was the result of a barrier, and the biogeographic barrier remained, then species [C + D] became sympatric with species A through back-dispersal across the same barrier. By allowing for the removal of distributions, VIP allows for back-dispersal into an area. The relative importance of distribution removals can be controlled in VIP by changing the 'cost of removal' (Arias, 2011).

VIP (Arias, 2010) has been used to evaluate taxon history and locations of potential biogeographic barriers for a range of organisms in different areas including but not limited to:

spiders in the genus *Cyriocosmus* Simon across South America (Ferretti *et al.*, 2012), among cave dwelling spiders in the genus *Ischyropsalis* Koch, across Europe (Schönhofer *et al.*, 2015), between genetically unique populations of the cave dwelling rodent, *Leopoldamys neilli* (Marshall) in Thailand (Latinne, 2012) and among between mayflies in the genus *Campsurus* Eaton across South America (Molineri and Salles, 2013). Most recently Domìnguez *et al.* (2016) tested vicariance hypotheses in southern Chile and Argentina using multiple insect taxa.

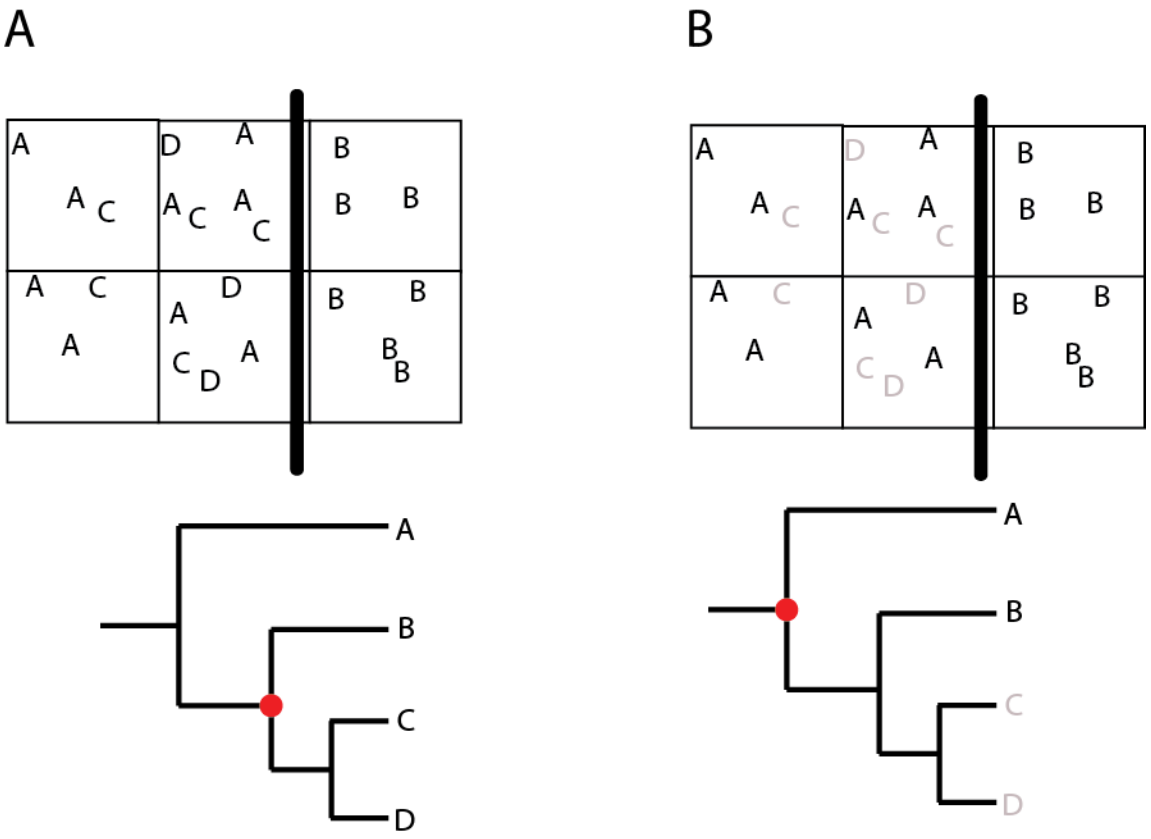

Figure 2: Two reconstructions showing disjunct distributions without distribution removal (A) and with distribution removal (B), shown in grey text. Solid black line represents a barrier to dispersal and red circles indicate nodes with disjunct distributions.

CHAPTER 2

INTRODUCTION

Globally, as much as 85% of wild flowering plants and crops rely on pollination by animals (Klein *et al.,* 2007; Ollerton *et al.,* 2011). Given the importance of bees it is necessary to understand their natural history and distribution. In order to understand the effects of the physical environment on the speciation of bees, biogeographic studies are required. Chile provides a unique environment for looking at the speciation of bees.

Chile is located along the western coast of South America bordered by Peru to the north and by Bolivia and Argentina to the northeast and east respectively. Chile is a long narrow country, 4,337 km long and only about 360 km wide at its widest point which is at approximately 23°S latitude (Moreira-Muñoz, 2011). There are a large number of endemic plants and animals located here due to geographic isolation. For example, Montalva and Ruz (2010) estimated that at least 70% of Chile's bee species were endemic to that country. Chile is bordered by the Pacific Ocean to the west, the Andes mountain range to the east, sub-polar conditions to the south, and the Atacama Desert to the north which is arguably the driest desert on Earth (Hartley *et al.,* 2005). The focus of this research project was on bees located in the Atacama desert and surrounding areas covering the northern 5 of the 15 Chilean political regions; these regions are numbered, from north to south: XV, I, II, III, IV (Figure 3).

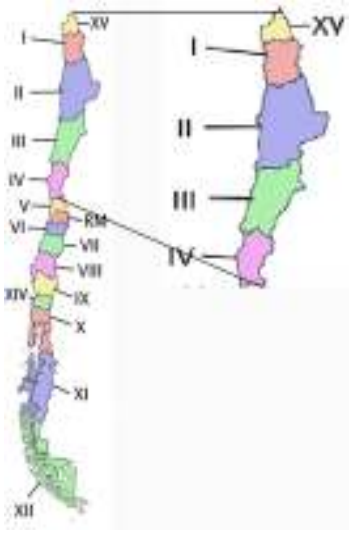

Figure 3: Political regions in Chile modified from Wikipedia.org CC BY-SA 3.0 License.

In northern Chile, from west to east, there are two mountain ranges; the coastal mountain range and the Andes mountain range. The coastal mountain range runs from Arica to Copiapo dividing the coastal desert (0-1500 masl (meters above sea level) from the central depression (600-3000 masl) which is located between the coastal mountains and the Andes mountain range (max elevation 6900 masl) (Moreira-Muñoz, 2011). The coastal desert is very dry and plants rely on fog, called Camanchaca, for vegetated lomas formations (Cereceda *et al.*, 2004; Cereceda *et al.,* 2008). The central depression in northern Chile ranges from hyper-arid (≤ 5 mm rain annually) (Garreaud *et al.*, 2010) to arid (≤ 50 mm rain annually) (Garreaud *et al.*, 2010) in regions XV to region IV with average annual rainfall measured in fractions of a millimeter (rain showers once every 10 years or more) with some areas in the core of the Atacama Desert with no recorded precipitation for the last 100 years (Houston, 2006).

Climate

The dry conditions of the Atacama Desert are due to atmospheric subsidence in the subtropical Pacific, which maintains an anticyclone in the southeast Pacific, the Humboldt Current which runs up the western coast of Chile, and the rainshadow effect caused by the Andes Mountains (Houston and Hartley, 2003; Hartley *et al.*, 2005; Garreaud *et al.*, 2010; Rech *et al.*, 2010). The anticyclone facilitates the transport of cool high latitude water towards the equator and the upwelling of cold sea water along the western edge of South America reduces the amount of precipitation along the coast (Garreaud *et al.*, 2010). As precipitation from the Amazon basin makes its way up the eastern slope of the Andes, the air gets cooler with increases in altitude (Houston and Hartley, 2003). As a result, most of the precipitation falls on the eastern slope and over the Altiplano, with little reaching the western slope. This creates a rainshadow

effect that helps to cause the dry conditions in northern Chile (Hartley *et al.*, 2005; Houston and Hartley, 2003; Rech *et al.,* 2010).

The date of the onset of hyper-arid conditions in the Atacama has been widely disputed as discussed in Rech *et al.* (2010), however, it is now generally thought that arid conditions (≤50 mm annually) persisted for at least the last 30 million years, possibly as long as 66 million years (Houston and Hartley, 2003; Hartley *et al.*, 2005; Gerreaud *et al.,* 2010). Arid conditions are caused by the subtropical anticyclone discussed above while hyper-arid conditions are typically associated with the rainshadow effect caused by the rise of the Andes Mountains in combination with the anticyclone (Houston and Hartley, 2003; Hartley *et al.*, 2005; Rech *et al.,* 2010). The rainshadow effect would have arisen as the Andes reached approximately 2000 m in elevation (Houston and Hartley, 2003); however, the antiquity of the Andes is also highly debated as different methods of assessing the age of the mountains yield different results. In a review of these methods Gregory-Wodzicki (2000) suggested that the Central Andes, located in Peru, Chile, Bolivia, and Argentina between 15°S to 33°S, were at approximately half their current elevation 10 million years ago (mya) while Rech *et al.* (2010), looking at stable isotopes in the Calama Basin, suggests the onset of hyper-arid conditions due to the rainshadow effect occurred between 12 to 7 mya. This was supported by Jordan *et al.* (2014) who concluded that the onset of hyperarid conditions began 12 mya in association with the uplift of the Andes. By examining paleosol carbonates on the eastern Andean slope Garzione *et al.* (2014) suggests there was a rapid uplift of 1.9 +/- 0.7 km in the Central Andes between 16 to 13 mya.

The Atacama Desert is divided into two precipitation zones where, in the northeast, most of the precipitation falls in the summer months (December, January, and February) and, in the southwest, most of the precipitation falls in the winter months (May, June, and July) (Messerli *et*

*al.,*1993; Arroyo *et al.,* 1998; Latorre *et al.,* 2002; Houston, 2006). The junction between the regions occurs at an oblique angle from the SE (~25°S) to the NW (~19°S) (Houston, 2006; Figure 4).

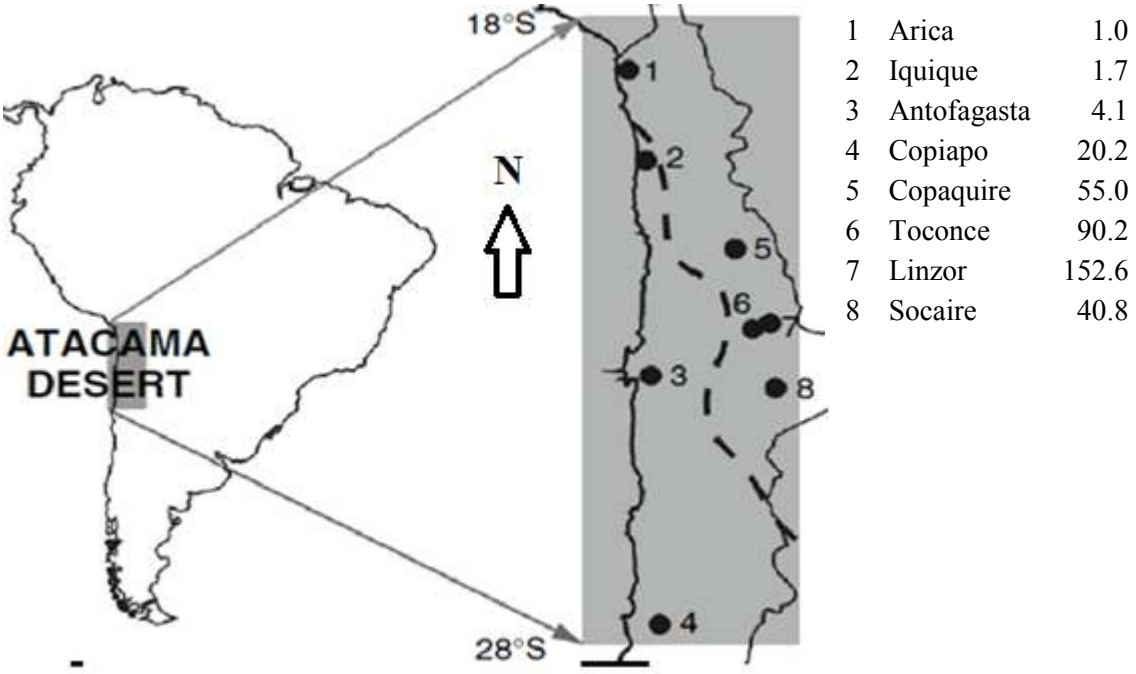

Figure 4: A representation of the summer/winter rainfall transition zone (dashed line) in the Atacama Desert, Chile. Points correspond to weather stations named to the right with the mean annual precipitation (mm) for each. Modified from Houston (2006). Scale bars = 100 km.

The position of the transition zone between summer/winter rainfall is influenced by different sources of precipitation and the El Niño Southern Oscillation (ENSO) climate system (Latorre *et al.,* 2002; Houston and Hartley, 2003; Ambrizzi *et al.*, 2005; Houston, 2006). On the northeast side of the transition zone most of the precipitation comes from the Amazon basin, these summer storms are referred to as the *Invierno Boliviano.* Strong easterly winds carry precipitation over the Altiplano onto the western slope of the Andes Mountains. In strong La Niña years these easterlies increase in strength carrying the precipitation to lower altitudes into the Atacama. On the southwest side of the transition zone most of the precipitation comes from

winter storms off the Pacific Ocean carried in by strong westerly winds. In El Niño years these westerlies are stronger compared to the weakened easterly trade winds and bring more precipitation which is carried further inland and north along the coast (Vuille and Ammann, 1997; Ambrizzi *et al.*, 2005). This was evident during the 1991-1992 El Niño event with increased precipitation in Antofagasta in June of 1991 and snowfall in Calama in May of 1992 (Messerli *et al.,* 1993). Vuille and Ammann (1997) estimated a mean annual winter snowfall of 20-50 mm (mm water equivalent) between the years 1990-1992 in the Altiplano to the southeast of Calama. During the same period Fray Jorge National Park (30.5°S) had rainfall of over 200 mm in 1991 (compared to 32-89 mm/year for years 1989, 1990, 1993, and 1994) (Gutiérrez *et al.* 1993, as cited by Jaksic, 2001).

Little is known about the formation of this rainfall transition zone in northern Chile. However, during the mid-Pliocene (3.0 to 3.3 mya) the eastern Pacific was under constant El Niño conditions (Jordan *et al.*, 2014). This suggests that the majority of rainfall in northern Chile during this time was primarily winter rain, as strong El Niño years result in an increase of winter precipitation in northern Chile, with little to no summer rain (Vuille and Ammann, 1997; Ambrizzi *et al.*, 2005). Current ENSO conditions formed over South America between 2.0 to 2.2 mya (Amundson *et al.*, 2012) but the transition zone between summer and winter rainfall may not have been in its current location until the late glacial/early Holocene (Approx. 12,000 years before present (BP)) after the summer precipitation zone extended 9 to 12 degrees southwards in latitude to its current position (Messerli *et al.,*1993).

The formation and/or movement of the summer/winter rain transition zone may have acted as a barrier to dispersal for bees in northern Chile. Arroyo *et al.* (1998) showed that it is at this boundary where the southernmost and northernmost ranges of related plant species meet, in

Llullaillaco National Park. Monckton (2016) also noted a pair of sister taxa in the genus *Chilicola* (*Heteroediscelis*) Toro & Moldenke, with one species found north of the transition zone that is sister to a clade comprising two species to the south.

There is also evidence that there were periods of increased precipitation in the Atacama in the last 45,000 years (Messerli *et al.,* 1993; Betancourt *et al.,* 2000; Latorre *et al.*, 2002; Latorre *et al.,* 2006; Diaz *et al.*, 2012; Gayo *et al.,* 2012). Examining the history of water catchments and lakes in the Altiplano, between 23°S to 24°S Messerli *et al.* (1993) concludes that there was an increase in precipitation of 60-70% between 17,000 to 11,000 years BP. Comparing pollen loads in the same area it was clear that the climate was much wetter from 11,000 to 7000 years BP (Messerli *et al.*, 1993). Based on reduced pollen profiles and evidence of increased irrigation by indigenous people, the climate became drier 3000 years BP (Messerli *et al.*, 1993).

Studying rodent middens in the Rio Salado basin (22°) between 2910 to 3150 masl Latorre *et al.* (2006) found alternating wet and dry periods (Figure 5). In wet years rodent middens contained plant material typically found at higher elevations where there is relatively more water compared to lower elevations. Between 17,000 to 16,200 years BP there was as much as twice the amount of precipitation in the area (Latorre *et al.*, 2006). There were also wet periods associated with middens dating 11,800 to 9600, 7300 to 6700, 3500 to 2300, and 800 years BP with dry periods at 14000, 8900 to 8600, and 4900 years BP. Latorre *et al.* (2002) and Betancourt *et al.,* (2000) find similar wet periods at rodent midden sites located between 22°S to 24°S at elevations ranging from 2400 m to 3100 masl (Figure 5). However, between 22°S to 24°S latitude, Latorre *et al.* (2002) examined middens dating back 45,000 years BP. There is evidence of increased precipitation based on a midden older than 44,500 years containing a large

proportion of steppe grass (Latorre *et al.*, 2002). However, conditions were intermittently dry between 45,000 to 22,000 years BP with varying degrees of steppe grasses being found in 3 middens. Other wet periods are similar to those found in Latorre *et al*. (2006) with evidence of present day hyperaridity after 3000 years BP.

Diaz *et al.* (2012) examined rodent middens from three sites in the Coastal Desert from 24°S to 25.3°S (1200-1900 masl) and one site located on the eastern slope of the Andes at 2750 masl (25.8°S). The coastal middens showed increases in plant diversity due to increased rain or runoff from higher elevations at 28,100, 21,300, 17,300, and 3,700 years BP (Figure 5). Middens dating at 19,300 years BP and 1,100 years BP to present had similar plant assemblages as are currently found there today suggesting very dry climates. There were periods of increased precipitation at the 2750 m site at 34,500 and 18,900 years BP while middens dating 6,100 years old and younger had similar plant taxa suggesting a stable climate for the last 6000 years at this site.

Gayo *et al*. (2012) conducted a stratigraphic study in the hyper-arid core of the Atacama Desert (21° to 21.5°) from 900-1000 masl. They found three time periods (17,000 to 14,200 years BP, 12,100 to 11,400 years BP, and 1000 to 710 years BP) in which there was increased runoff from higher elevations to the west which caused the formation of wetland/riparian ecosystems (Figure 5). The two later time periods are similar to periods of increased precipitation at higher elevations found by Latorre *et al.* (2002, 2003, 2006) (Figure 5).

Rodent middens allow for a brief look at the climactic conditions in northern Chile, however, they are not stratigraphically continuous (Betancourt *et al.,* 2000). This may explain some of the variation between sites seen in Figure 5, as 1000 years is enough time for both wet

(blue squares) and dry periods (red squares) to be recorded within a short span of time (green squares).

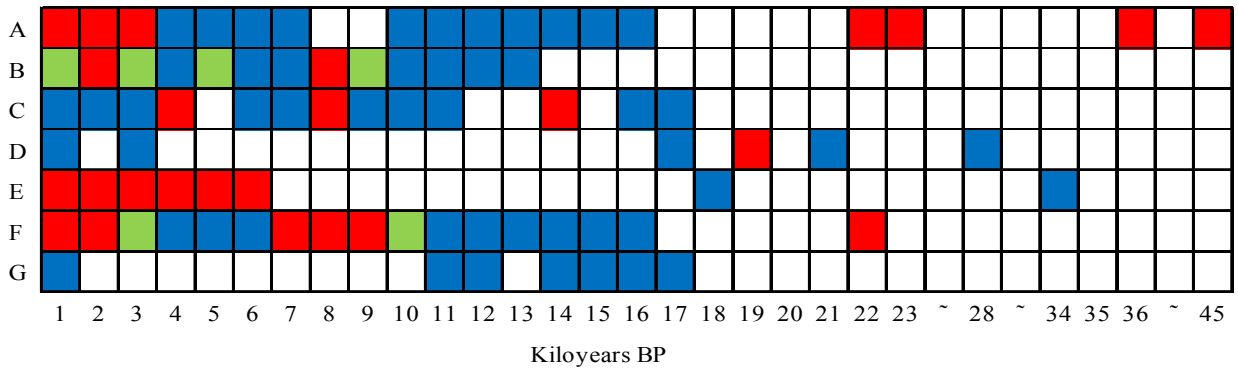

Figure 5: Summary of wet and dry periods based on the following publications: A: Latorre *et al.* (2002), B: Latorre *et al.* (2003), C: Latorre *et al.* (2006), D: Diaz *et al.* (2012) coastal, E: Diaz *et al.* (2012) Andes, F: Betancourt *et al.* (2000), G: Gayo *et al*. (2012). Blue squares represent wet periods, red squares represent dry periods, and green squares, at 1000, 3000, 5000, 9000 and10,000 represent 1000 year periods where both wet and dry events were recorded. No information was available for periods 24,000-27,000, 29,000-33,000, and 37,000-44,000 years BP.

Biogeography

Biogeographic areas have been described for Central and South America by Morrone (2006). He divided South America into biogeographic regions, subregions, dominions, and provinces based on cladistic biogeography and panbiogeography. Three provinces are included in northern Chile; the Puna, Atacama, and Coquimbo. The Puna includes western Bolivia, southern Peru, northern Chile and Argentina and is at high altitude. The Atacama province is located in northern Chile between 18°S to 28°S. The Coquimbo province is located further south at 28°S to 32°S (Figure 6). The boundary between the Puna and Atacama provinces is similar to the diagonal between summer/winter rains, however, this boundary divides the summer rainfall area in regions XV and I (compare Figures 4 and 6).

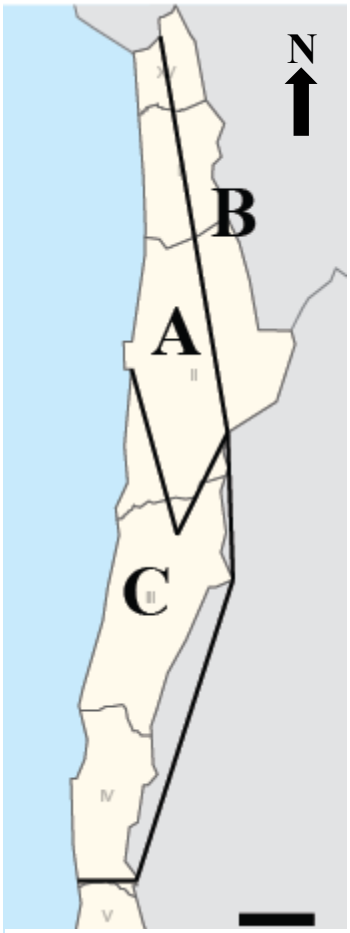

Figure 6: Biogeographic provinces, described by Morrone (2006), located in northern Chile: the Atacama province (A), the Puna province (B), and the Coquimbo province (C). Scale = 150 km.

Through the examination of bees found in northern Chile, I will take an alternate approach to vicariance biogeography based on the ideas of Hovenkamp (1997, 2001) using the SAV method using VIP (Arias *et al.,* 2011). By looking for disjunct sister pairs, in distantly related taxa, we are able to determine the approximate locations of biogeographic barriers in northern Chile. The purpose of this study is to examine three bee genera (*Neofidelia, Callonychium,* and *Caenohalictus*) across three families (Megachilidae, Andrenidae, and Halictidae respectively) that appear to include disjunct distributions across the transition zone between summer and winter rains in northern Chile.

Taxa Studied

The genus *Neofidelia* Moure and Michener is endemic to Chile, but its range was predicted to reach southern Peru (Dumesh and Packer, 2013), and this was confirmed with the collection of *N. apacheta* Dumesh and Packer in Arequipa, Peru in 2015 (Ferrari, personal communication). The genus is sister to the remaining Fideliinae (*Fidelia s.l.* with or without *Pararhophites*) and it has been considered to represent its own subtribe, the Neofideliina (Engel, 2004) elevated to tribe in Engel (2005). Gonzalez *et al.* (2012), based on their morphological phylogeny, found the family Fideliinae to be paraphyletic and raised the two tribes Fideliini (including *Neofidelia*) and Pararhophitini to the subfamily level. Litman *et al.* (2011), in their molecular phylogeny, also recognizes the paraphyly of Fideliinae but shows a non-monophyly of Fideliini, due to the genus *Neofidelia* which was found to be sister to all other Megachilidae. Until recently, only two

species of *Neofidelia* were known, *N. profuga* Moure and Michener and *N. longirostris* Rozen. Recently, three additional species were described (Dumesh and Packer, 2013). While the phylogeny for two species is trivial, the description of an additional three species makes the phylogenetic relationships within *Neofidelia* of some interest, particularly in regards to the transition between summer and winter rains in northern Chile as there appears to be a disjunction between northern and southern species there.

The genus *Callonychium* Brèthes is found in Chile, Argentina, Paraguay, and Brazil (Ruz, 1991). However, the 3 species described by Toro and Herrera (1980) and *C. chilense* (Friese) are endemic to Chile. All four Chilean species of *Callonychium* belong to the subgenus *Paranychium* Toro, which was once thought to be endemic to Chile (Cure and Wittmann, 1990) until the discovery of *C.* (*Paranychium*) *minutum* (Friese) known from Argentina (Ruz, 1991, Michener, 2007). The Chilean *Callonychium* are of interest because 3 of the 4 described species are located in northern Chile on either side of the summer/winter rain diagonal.

The genus *Caenohalictus* Cameron is found throughout South America, especially in Andean countries, as well as Central America and Mexico (Michener, 2007; Celis *et al.*, 2014). Rojas and Toro (2000) recognized 16 species throughout Chile from the Atacama Desert to Patagonia. The Chilean *Caenohalictus* are of interest because they are commonly collected in northern Chile and are found on either side of the summer/winter rain diagonal.

METHODS

Materials Examined

Specimens for this research project were collected by me, Spencer Monckton, and Dr. Laurence Packer totaling 4 collecting trips over a 2 year period. The first trip was from January to May 2013, the second was from September to December 2013, the third was from February to

March 2014 and the fourth was from November to December 2014. Specimens of *N. submersa* Dumesh and Packer, *N. camanchaca* Dumesh and Packer, *Callonychium aricense* Toro and Herrera, and *Caenohalictus dolator* (Vachal) were also examined from an additional collecting trip in the spring of 2015, conducted by Dr. Laurence Packer.

Our primary method of collecting involved pan traps, which have become a common method for sampling bees (Droege *et al.*, 2010). Similar to Westphal *et al.* (2008) we used white, blue, and yellow pan traps partially filled with a preserving liquid. For this study we used propylene glycol as the preservative because it is non-toxic to vertebrates that may drink it (Skvarla *et al.*, 2014), it is readily available for purchase in Chile, and it does not evaporate as quickly as water. The traps were placed opportunistically under/near plants across the 5 most northern political regions in Chile. We also placed 5 W-E transects, each with 8 sampling sites, consisting of 9 pan traps (3 white, 3 blue, 3 yellow) located every 500 m of elevation, from 500 to 4000 masl (except most northern and most southern transects which went up to 3500 masl) (Figure 7).Vane traps were also used for collecting across northern Chile and have been left out for as long as 1 year at a time during previous collecting trips conducted by the Packer lab at York Univeristy, Toronto, Canada. In addition to the above methods bees were also collected using a hand net when bees were observed visiting flowers. All bees caught with a hand net were either killed and pinned in Chile or stored in 95% ethanol. Pan and vane trap samples were stored in propylene glycol until they were sorted and pinned at York University, Toronto ON.

Figure 7: Five transects placed in northern Chile from January-May, 2013 and September-December, 2013.

Specimens of *Neofidelia, Caenohalictus*, and *Callonychium* currently residing in the Packer Collection at York Univeristy, Toronto, Canada (PCYU)

were identified to species using Dumesh and Packer (2013), Rojas and Toro (2000), and Toro and Herrera (1980) respectively. In total 542 *Neofidelia* specimens were examined from 111 localities, 510 *Callonychium* from 67 localities, and 747 *Caenohalictus* from 188 localities.

In addition to the cytochrome c oxidase subunit I (CO1) sequences already available from the Barcode of Life Data Systems database (BOLD). Select specimens had their mid-leg removed and sent to the Center for DNA Barcoding (CCDB) for sequencing in Guelph, Canada using standardized protocols as outlined in Herbert *et al.* (2003), Ivanova *et al.* (2006) and Ratnasingham and Herbert (2007). The Barcode Index Number System (BIN) clusters CO1 sequences together based on two clustering algorithms, single linkage clustering and Markov clustering (Ratnasingham and Herbert, 2013). The single linkage algorithm clusters sequences together based on a threshold of 2.2% pairwise distance. Sequence clusters are refined with Markov clustering which may split clusters that show high sequence variation and internal partitioning within the 2.2% threshold. When a sequence shows >4.4% divergence from its closest neighbouring cluster it is assigned to a new BIN which may represent a different species than the neighbouring cluster (Ratnasingham and Herbert, 2013). In cases where BIN analysis splits what was previously identified as a single species into more than one BIN (see Ratnasingham and Herbert, 2013) those specimens were examined to see if morphological differences could be found between specimens from different BINs. If consistent morphological differences are observed, more than one species should be considered based on both morphological and molecular data.

All barcode specimens for *Neofidelia, Callonychium,* and *Caenohalictus* underwent bidirectional sequencing with the most common initial primers LepF1 and Lep R1, which are commonly used for bees (Ratnasingham and Herbert, 2007).

Phylogenetic trees were produced for all three genera based on morphological characters and a combination of morphological and molecular data for *Neofidelia*, full length (658 base pairs (bp)) DNA sequences of the CO1 mitochondrial gene for all *Callonychium* species found in Chile, and full length sequences for all *Caenohalictus* taxa, that could be associated with DNA barcodes, collected in northern Chile.

Phylogenetic Analysis

Morphological characters were chosen for *Neofidelia* based upon previous work on the phylogeny of fideliines (Engel, 2004; Gonzalez *et al.,* 2012) and comparisons of the five species of *Neofidelia*. Outgroups were chosen from among the subgenera (*Fideliopsis* and *Fidelia s.str.* (Whitehead & Eardley, 2003)) of *Fidelia* (although these are considered distinct genera by Engel (2004)) along with *Pararhophites quadratus* (Friese) and *Lithurgus spiniferus* Cameron to confirm unambiguous synapomorphies for the tribe Fideliini.

All species except the *Fidelia* spp. were disarticulated following clearing in 5% KOH at room temperature for 24 hrs then stored in glycerine. Both *Fidelia* spp had their genitalia, hidden sterna, and mouthparts removed, cleared in 5% KOH at room temperature for 6 hrs and then stored in glycerine.

A data matrix of 59 morphological characters and 9 taxa (4 outgroup, 5 ingroup) was analysed in TNT (Tree Searching using New Technology) (Goloboff *et al.* 2008) using *L. spiniferus* to root the tree as it is a member of a different subfamily, the Lithurginae, to the remaining 8 taxa in this study (Gonzalez *et al.*, 2012). The majority of characters were binary, but the 6 multi-state characters were treated as non-additive. The data set is small enough to make an exhaustive tree search using implicit enumeration, which guarantees discovery of the most parsimonious tree(s) (Goloboff *et al.*, 2008). Characters were weighted using successive

approximations character weighting (SACW) as outlined by Carpenter (1988). Node support was assessed using both symmetric resampling with GC (Group present/Contradicted) values, which is the number of times a group was found minus by the number of times the group was contradicted by the next most common grouping, and traditional bootstrapping with absolute frequencies, both set at 1000 replicates using implicit enumeration (Goloboff *et al*., 2003).

In addition to the analysis based solely on morphological characters, a second analysis was conducted for *Neofidelia* based on the morphological characters discussed above and full length CO1 sequences for the ingroup, except *N. submersa* for which a CO1 sequence was not available.

Full length CO1 sequences for the four *Callonychium* species [*C. chilense, C. coquimbense* Toro and Herrera, *C. atacamense* Toro and Herrera, and *C. aricense*] were downloaded from BOLD along with a full length sequence of a cryptic species found within *C. aricense*'s range. Hereafter the two sets of sequences for "*C. aricense*" are referred to as *C. aricense1* and *C. aricense*2 (see results). *Calliopsis trifasciata* (Spinola) was used as an outgroup because it is a member of a distinct well supported genus belonging to the same tribe as *Callonychium*, the Calliopsini (Ruz, 1991).

Full length CO1 sequences for *Caenohalictus rostraticeps* (Friese), *C. dolator*, and 4 of the 5 BIN clusters that key to *C. cuprellus* (Vachal) in Rojas and Toro (2000), hereafter referred to as *C. cuprellus* 1-5, were downloaded from BOLD. *Caenohalictus cuprellus3* had a shorter CO1 sequence of 572 bp, but still had the 300 bp that are minimally necessary for BIN analysis (Ratnasingham and Herbert, 2013). *Caenohalictus cuprellus3* used the secondary primer sets LepF1/C_ANTMR1D and RonMWASPdeg_t1/LepR1. *Ruizanthedella mutabilis* (Spinola) was

used as an outgroup because it belongs to a well-supported genus in the same subtribe as *Caenohalictus*, the Caenohalictina (Gonçalves and Melo, 2010).

Neighbor joining trees, based on CO1 sequences >200 bp, were created in BOLD (Ratnasingham and Herbert, 2007), using the BOLD aligner and pairwise deletion for gaps/ ambiguous bases to show sequence clusters and associated BINs for all three genera. All neighbor joining trees and barcode gap analyses are found in appendix A.

The sequences for both *Callonychium* and *Caenohalictus* were aligned in Mega version 6 (Tamura *et al.*, 2013) using Muscle and then used for parsimony analysis in TNT (Goloboff *et al.*, 2008) and Bayesian Inference in MrBayes (Huelsenbeck and Ronquist, 2001). The same analytical methods (for TNT) were used for these genera as in *Neofidelia*, discussed above. Bayesian analysis was conducted in MrBayes v.3.2.6 (Huelsenbeck and Ronquist, 2001) via CIPRES Science Gateway (Miller *et al.*, 2001) adhering to methods similar to Groom *et al.* (2013) with a GTR + I + Γ substitution prior. Our analyses were run for 50 million iterations with every 1000^{th} tree sampled with a burnin proportion of 0.25.

Biogeography

Distribution maps for all three genera were generated in RStudio (2015) with the following packages: *maptools* (Bivand and Lewin-Koh, 2014), *raster* (Hijmans, 2014), *rgdal* (Bivand *et al.*, 2014), and *rgeos* (Bivand and Rundel, 2014). Individual georeferenced localities were plotted with estimated distributions being represented by a convex hull, which draws a line around the outermost data points, for each species (IUCN, 1994). Maps were edited in Adobe Illustrator CS6.

Spatial analysis of vicariance was conducted using the software VIP (Arias, 2011; Arias *et al.*, 2011). Based on the ideas of Hovenkamp (1997, 2001) a grid, of user-controlled size

measured in squared degrees, is overlaid on a map and species distributions are used to fill in the grid system hence negating the use of predefined areas. A gap in the distributions between sister taxa indicates allopatric speciation, either by vicariance or dispersal, and the approximate location of a biogeographic barrier (Arias, 2011; Arias *et al.*, 2011).

VIP was used to reconstruct the taxon history of *Neofidelia*, *Callonychium*, and *Caenohalictus* in order to determine disjunct sister pairs and the approximate location of a vicariant barrier (Arias *et al.,* 2011). The barrier can be located anywhere within the gap between two disjunct distributions. Only the distributions of the ingroup taxa were used in the analysis because the outgroup taxa are not found in the area of interest. The program uses a Mercator map projection so that the lines of latitude and longitude meet at right angles. The user can choose to fill in adjacent squares to a known locality to fill gaps between collection sites. For example, with a fill setting of 1, each grid square around the perimeter of a species record is filled. With a fill setting of 2, each grid square around the perimeter of a record is filled along with the squares directly adjacent to those, and so on. For this project a search was conducted for a grid size of (0.3° x 0.3°), which is approximately 900 km^2, with fill settings at 1 and with no overlap.

Two separate analyses in VIP were run for all taxa in this study. The first analysis was run with the cost of removal set to 1 which maximizes the number of possible disjunctions, by systematically removing species distributions (Arias, 2011). The second analysis was run with the cost of removal set to 5, which will minimize the number of distribution removals in the results from VIP (Arias, 2011).

RESULTS

Phylogenetic Analysis

The 59 characters and their states are enumerated in appendix B and the data matrix is shown in table S1 (appendix C). A complete list of all specimens examined is located in appendix D with all specific localities mentioned in-text depicted in Figure S22 (appendix E).

The analysis for *Neofidelia* yielded 3 parsimonious trees with lengths of 83 steps, with CI (Consistency Index) of 0.71 and RI (Retention Index) of 0.71. One tree (Figure 8) was retained after one round of SACW resulting in a tree with a CI of 0.81 and RI of 0.86. The monophyly of *Fidelia* spp. and *Neofidelia* were retained here as also found by Engel (2004) and Litman et al (2011).

Neofidelia profuga is sister to the other four species of the genus which share two synapomorphies (plesiomorphic state in brackets): a dorsal ridge on the anterior margin of the third phragma (no ridge) and a cleft in the anterior margin of S7 (no cleft). *Neofidelia apacheta* is sister to [*N. longirostris* + [*N. camanchaca* + *N. submersa*]] which share a single synapomorphy: the presence of a spine on the posterior margin of S7 (no spine). *Neofidelia longirostris* is sister to [*N. camanchaca* + *N. submersa*] which share one synapomorphy: a clypeus that extends more than 1.3X the width of the compound eye in front of the anterior tangent of the eye in lateral view (Dumesh and Packer, 2013: Figure 23) (not exceeding 1.1X width of eye).

The same topology was found for *Neofidelia* in the analysis based on morphology and CO1 sequences. The analysis yielded a single tree, which was stable to SACW, with a length of 226, CI of 0.90 and RI of 0.77 (Figure 9).

A single parsimonious tree was generated based on the 5 recognizable taxa of *Callonychium* with a length of 318, a CI of 0.80 and a RI of 0.57 (Figure 10). The only southern

species, *C. chilense,* is sister to the remaining four northern taxa while [*C. atacamense* + *C. coquimbense*] come out as sister to [*C. aricense1* + *C. aricense2*]. The maximum credibility tree, shown with posterior probability values, closely resembles the topology from parsimony analysis with the exception of the unresolved placement of *C. chilense* (Figure 11).

Callonychium aricense1 can be distinguished from *C. aricense2* by a truncate process on S1 and a pointed keel on the pygidial plate (Figure 12) compared to the rounded process and keel on *C. aricense2* (Figure 13). An additional BIN, from a specimen collected from Palo Buque in 2015, suggested that there may be an additional undescribed species of *Callonychium*. However, this specimen could not be morphologically distinguished from *C. aricense2*.

A single parsimonious tree was generated in TNT for *Caenohalictus* with a length of 306, a CI of 0.77 and a RI of 0.62 (Figure 14). Sequences from the 5 BINs that key to *C. cuprellus* grouped together during phylogenetic analysis. The maximum credibility tree, shown with posterior probability values, closely resembles the topology from parsimony analysis with the exception of the unresolved placement of the *C. cuprellus* group and the switch in positions for *C. cuprellus1* and *C. cuprellus5* (Figure 15).

No reliable morphological characters were found that could group specimens based on the 5 separate BINs for *C. cuprellus*.

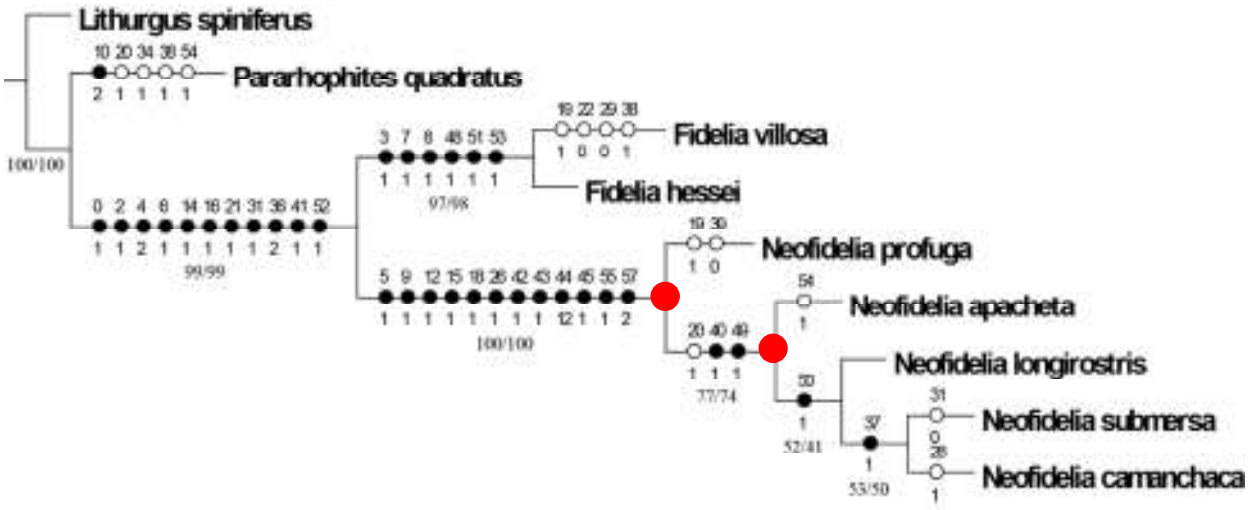

Figure 8: The single most parsimonious tree, based on morphological characters, for *Neofidelia* after SACW. Filled in black circles represent uniquely derived character states, open circles are homoplasious changes. Numbers just above and below the circles refer to the character and character state respectively. Numbers below the middle of the internodes are absolute values for traditional bootstrap in front of the forward slash and GC values for symmetric resampling after the slash. The red circles on the nodes indicate disjunct distributions between sister groups.

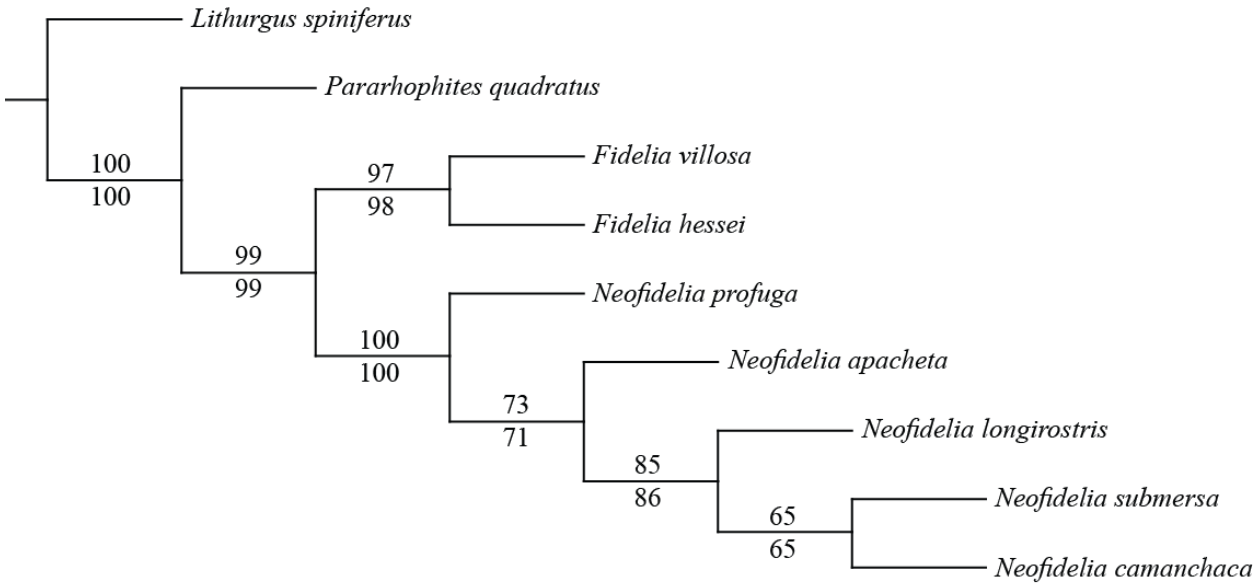

Figure 9: The single most parsimonious tree, based on morphological characters and DNA barcode sequences, for *Neofidelia*. Numbers just above the internodes represent absolute values for traditional bootstrap and the numbers below the internodes represent GC values for symmetric resampling.

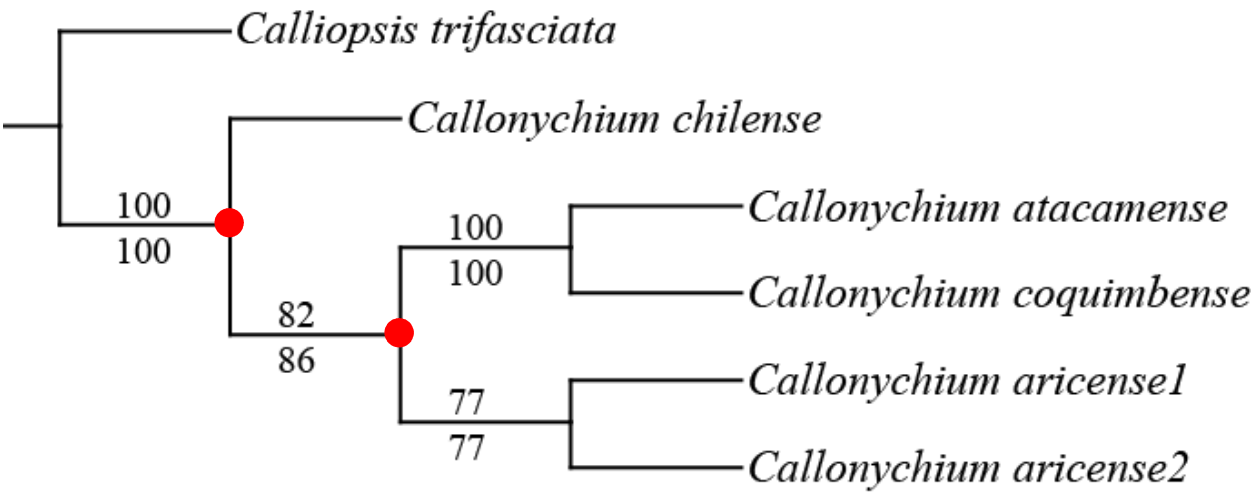

Figure 10: Single most parsimonious tree for *Callonychium* based on DNA barcode sequences. Numbers above the internodes represent the absolute frequencies for traditional bootstrap and numbers below the internode represent the GC values from symmetric resampling. The red circles on the nodes indicate disjunct distributions between sister groups.

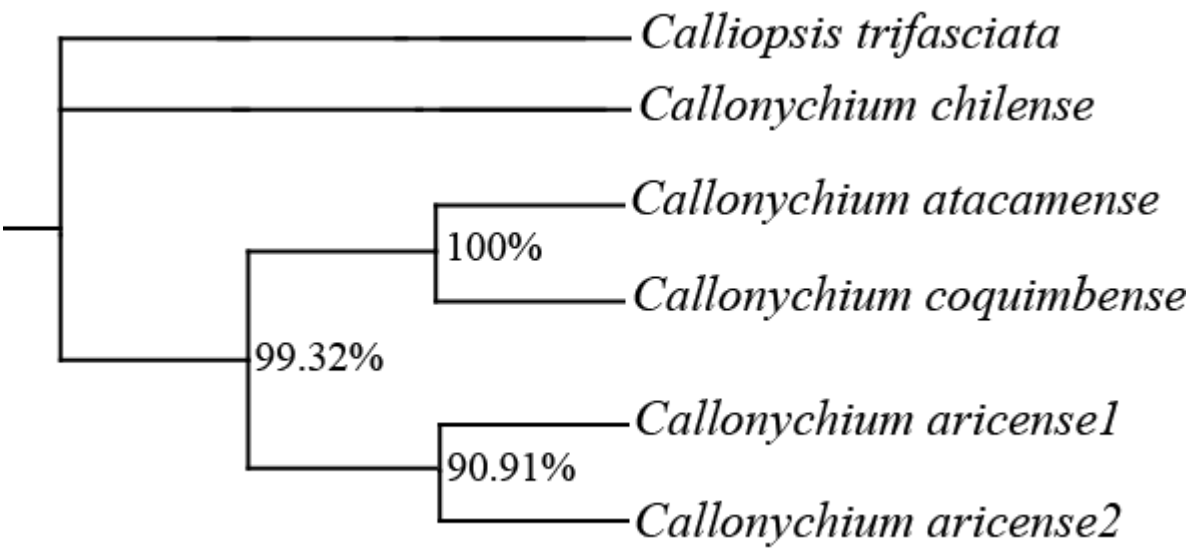

Figure 11: Maximum credibility tree for *Callonychium*. Numbers to the right of the nodes represent posterior probability in percent.

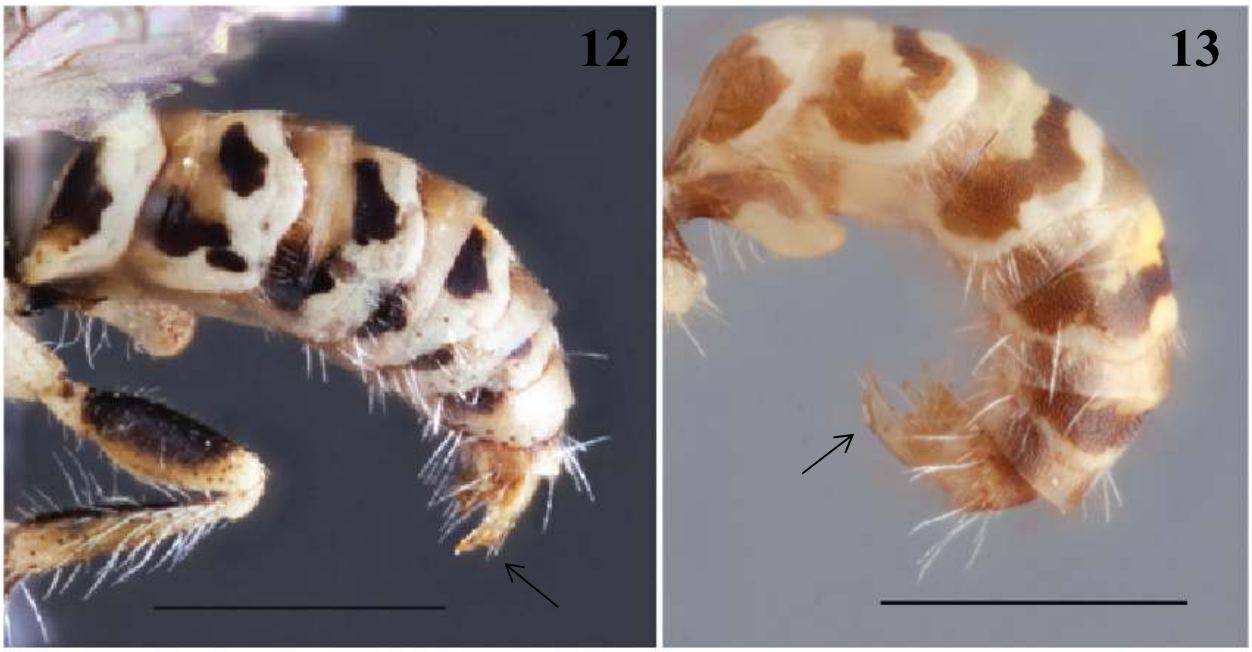

Figure 12-13: Fig. 12. *C. aricense1* male metasoma in lateral view showing a truncate process on S1 and a pointed keel on the pygidial plate, marked with an arrow; Fig. 13. *C. aricense2* male in lateral view showing a rounded process on S1 and a smooth rounded keel on the pygidial plate, marked with an arrow. Scale bars = 1mm

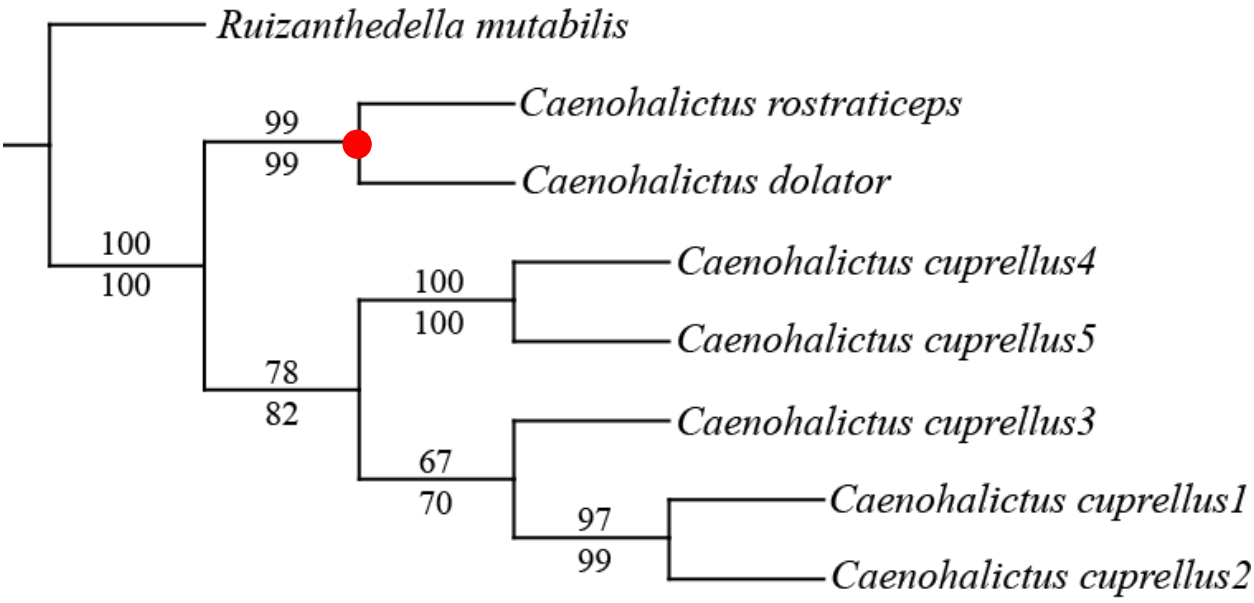

Figure 14: Single most parsimonious tree for *Caenohalictus* based on DNA barcode sequences. Numbers above the internodes represent the absolute frequencies for traditional bootstrap and numbers below the internode represent the GC values from symmetric resampling. The red circle on the node indicates a disjunct distribution between *C. rostraticeps* and *C. dolator*.

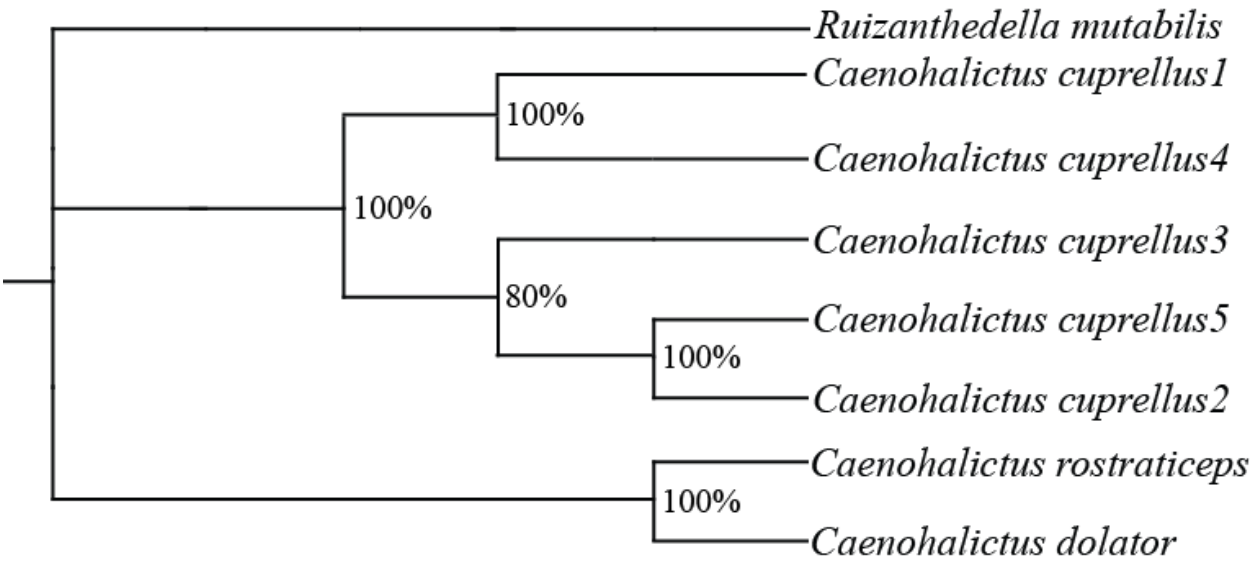

Figure 15: Maximum credibility tree for *Caenohalictus.* Numbers to the right of the nodes represent posterior probability in percent.

Biogeography

Neofidelia apacheta is found in political regions XV and I at elevations from 1600 m to 3200 masl (Figure 16). *Neofidelia submersa* is endemic to a single locality in region I, Alto Patache, a fog oasis just south of Iquique between 750 to 800 masl (Figure 16). *Neofidelia camanchaca* has in the past been mistakenly identified as *N. longirostris*, and has a larger range than previously suggested by Dumesh and Packer (2013). It is found along the coast from Chañaral in region III to Paposo in region II (Figure 16). *Neofidelia camanchaca* was collected outside the northern city of Antofagasta in Region II and Alto Patache (Region I) for the first time in 2015. *Neofidelia longirostris* is found at low elevations (below 450 masl) along the coast in region III completely within *N. profuga*'s range and overlapping with *N. camanchaca*'s southern limits (Figure 16). *Neofidelia profuga* is found in the northern half of region IV and all of region III up to 3100 masl (Figure 16). It has also been collected near the coast approximately 15km south of Taltal in Region II.

Two reconstructions were recovered in VIP for *Neofidelia*, both of which show a disjunction between *N. apacheta* and [*N. longirostris* + [*N. submersa* + *N. camanchaca*]] with the barrier residing between their distributions in regions I and II (Figure 16). The results of the analysis, with the cost of reconstruction set to 1, showed that there was an additional disjunction between *N. profuga* and *N. apacheta* with the distributions of [*N. longirostris* + [N. *submersa* + *N. camanchaca*]] removed. All disjunct nodes are marked in red in Figure 8.

Callonychium chilense is found in political regions V to VIII and is the most southern species of *Callonychium* found in Chile. *Callonychium coquimbense* is found primarily along the coast in region III and the northern tip of region IV, but as high as 1644 masl in region III (Figure 17). *Callonychium atacamense* is found below 1000 masl almost exclusively in region III with the exception of a single record collected just north of Taltal in region II (Figure 17). The most northern *Callonychium*, *C.aricense1* and *C. aricense2*, are found in regions XV to II. They almost completely overlap with each other in distributions at higher elevations ranging from 1620 to 3384 masl with the exception that only *C. aricense2* has been collected below 1000 m in the coastal mountain range south of Iquique in region I (Figure 17).

The fully resolved tree for *Callonychium* obtained from TNT was used for biogeographic analysis. A single reconstruction was returned in VIP for *Callonychium*, for both analyses with the cost of removal set to 1 and 5 respectively, with two disjunct sister pairs (nodes marked red in Figure 10). The first disjunction occurred between *C. chilense* and the remaining four species with the biogeographic barrier residing in region IV or V between the distributions of *C. chilense* and *C. coquimbense*. The second disjunction occurred between [*C. atacamense* + *C. coquimbense*] and [*C. aricense1* + *C. aricense2*] with the biogeographic barrier residing between their distributions in region II (Figure 17).

Caenohalictus rostraticeps is found from the southwest corner of region II to Region Metropolitana (RM) from coastal locations to as high as 3024 masl, with the majority of its records being from the northern half of region IV and throughout region III (Figure 18). *Caenohalictus dolator* is found in regions XV to II primarily from 1000 to 4000 masl, with the exception of two records collected at approximately 500 masl (Figure 18). The range of all 5 species that key to *C. cuprellus* overlaps with that of *C. dolator* at high elevations in regions XV to II (Figure 18).

For analysis in VIP the five species that key to *C. cuprellus* were treated as a single species because not all available specimens can be reliably associated with the five different BINs and all specimens that key out to *C. cuprellus* are found exclusively in the summer rainfall area and thus their precise taxonomic status does not impact my biogeographic scenario. A single reconstruction was returned for *Caenohalictus*, for both analyses irrespective whether the cost of removal was set to 1 or 5, showing one disjunct sister pair (node marked in red in Figure 14). The disjunction occurred between *C. rostraticeps* and *C. dolator* with the dispersal barrier lying between their distributions, largely in region II (Figure 18).

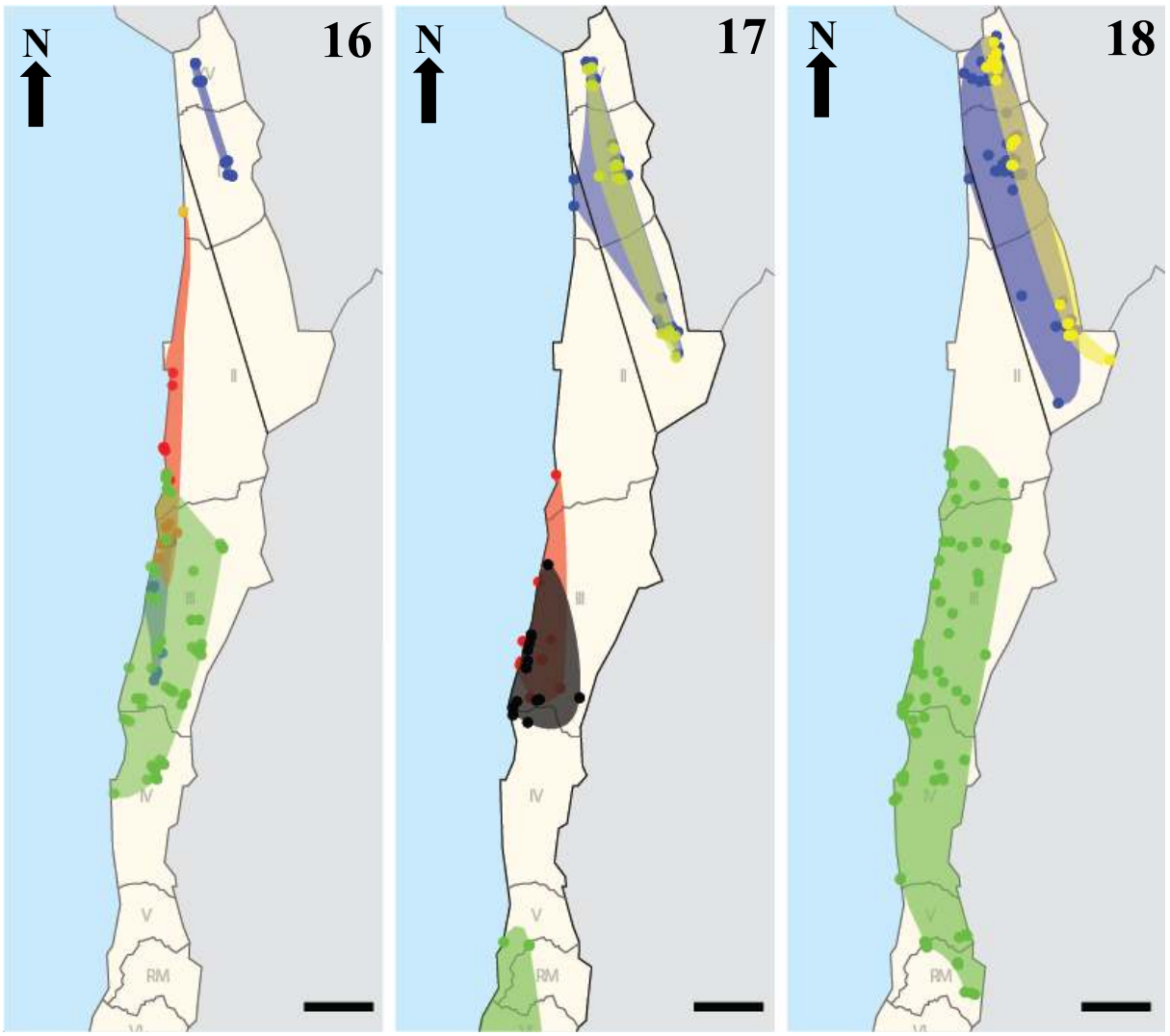

Figure 16-18: Fig.16: Distribution of *Neofidelia* in northern Chile. Blue = *N. apacheta*, Yellow = *N. submersa*, Red = *N. camanchaca*, Black = *N. longirostris*, Green = *N. profuga*. Fig.17: Distribution of *Callonychium* in northern Chile. Blue = *C. aricense2*, Yellow = *C. aricense1*, Red = *C. atacamense*, Black = *C. coquimbense*, Green = *C. chilense*. Only northern portion of range shown for *C.chilense*. Fig.18: Distribution of *Caenohalictus* in northern Chile. Blue = *C. dolator*, Yellow = *C. cuprellus*, Green = *C. rostraticeps*. Black diagonal line in all three figures represents the approximate location of the barrier between summer/winter rainfall. Scale bars = 150 km.

DISCUSSION

The SAV methods outlined in Arias *et al.* (2011) allowed us to examine TVEs in northern Chile by looking for disjunct distributions between multiple pairs of sister taxa. I found evidence for a SVE in northern Chile based on four TVEs found in three genera of bees

belonging to three separate families. There are 4 disjunct sister groups that show overlapping distributions on either side of the transition zone between summer/winter rains as seen in Figures 16-18. In addition to our findings there is also evidence of a TVE in the subgenus *Chilicola* (*Heteroediscelis*) with a single disjunct pairing on either side of the summer/winter rain transition zone (Monckton, 2016).

The barrier between summer and winter rainfall may have acted as a vicariant barrier which influenced speciation of *Neofidelia*. This rainfall barrier lies within the distribution gap between *N. apacheta* and [*N. camanchaca* + *N. submersa*] (Figure 16), as was supported by both analyses in VIP. Additionally when the distributions of [*N. longirostris* + [*N. camanchaca* + *N. submersa*]] are removed there appears to be an additional disjunction between *N. profuga* and *N. apacheta*, possibly across the rainfall barrier which lies within the disjunct distributions. This implies that the presence of [*N. longirostris* + [*N. camanchaca* + *N. submersa*]] in the winter rainfall zone was due to a dispersal event across the transition barrier (Arias, 2011, Arias *et al.*, 2011).

It is still unclear if the disjunction between *N. profuga* and *N. apacheta* was due to vicariance or dispersal. However, Litman *et al*. (2011) performed a molecular phylogenetic analysis of the major groups of Megachilidae and used a Bayesian divergence dating analysis to estimate divergence times at the various nodes in their tree. According to their results, *Neofidelia* diverged from the remaining Megachilidae approximately 126 million years ago and they argued for a Gondwanan break-up being a cause for New World – Old World disjunctions near the base of their phylogeny. Their data suggest that the crown group formed by *N. profuga* and *N. longirostris*, the two species known at the time of their work, arose approximately 15 mya which predates the constant El Niño conditions outlined in Jordan *et al.* (2014) and the movement of

the transition zone discussed in Messerli *et al.* (1993). Given that *Neofidelia* is an old genus it is possible that the rainfall barrier caused a disjunction in the distributions between *N. profuga* and *N. apacheta* via vicariance. However, a time-calibrated phylogeny including the new species described by Dumesh and Packer (2013) would shed more light on this disjunction and may make it possible to make stronger arguments as to whether it was vicariance or dispersal that caused the disjunction between *N. profuga* and *N. apacheta*.

The *Callonychium* found in northern Chile show disjunct sister groups across the same area as seen in *Neofidelia*, with the exception of the two records of *C. aricense2* found along the coast, south of Iquique, just inside the northern tip of the winter rainfall zone described by Houston (2006) (Figures 16-17). Given the rarity of collecting bees in the harsh coastal desert we may yet see an overlap of southern and northern species distributions here associated with the transition between summer/winter rains as seen in Arroyo *et al.* (1998) for the flora in Llullaillaco National Park which straddles this border.

The split of *C. aricense* based on both CO1 sequences and morphological characters suggests that there is an undescribed species (herein termed *C. aricense2*) that has an almost completely sympatric distribution with *C. aricense1*. It is likely that *C. aricense1* is the same species described by Toro and Herrera (1980) due to the truncate process on S1 (Figure 12; see also Toro and Herrera, 1980: Figure 36) and thus it is *C. aricense2* that requires formal description.

Caenohalictus also shows a disjunction across the same area as *Neofidelia* and *Callonychium* between the summer and winter rainfall zones (Figures 16-18). As seen with *C. aricense1* we also find an individual of *Caenohalictus* (*C. dolator*), which is primarily found in the summer rainfall area, just inside the northern portion of the winter rainfall zone just south of

Iquique in 2015 (Figure 18). Although this is a single record it will be interesting to see, with future collecting in the coastal desert, if southern and northern species of *Caenohalictus* will overlap here.

Although a complete phylogeny for all Chilean *Caenohalictus* was not available it still appears that speciation events in this genus were influenced by the transition between summer/winter rains based on the disjunction between *C. rostraticeps* and *C. dolator* (Figure 18). *Caenohalictus rostraticeps* and *C. dolator* are morphologically very similar and both males and females key out at the same couplet in Rojas and Toro (2000). Both species have a long malar space which distinguishes them from the only other northern *Caenohalictus, C. fulgens* (barcode sequence not available) which has a linear malar space similar to the remaining species of *Caenohalictus*. When a complete phylogeny becomes available, the number of disjunct nodes, and their placement within the tree may change but the location of the disjunction will likely remain the same in northern Chile as it is clear that *C. rostraticeps* are found exclusively to the south of the rainfall transition zone and, with the exception of a single *C. dolator* record, there are two to five species (depending on the situation with *C. cuprellus*) found exclusively to the northeast of the same proposed barrier.

A possible explanation for the apparent splitting of *Caenohalictus cuprellus* into 5 separate BINs would be the unintentional amplification of the intercellular reproductive symbiont *Wolbachia* (Smith *et al.*, 2012; Stahlhut *et al.*, 2012). *Wolbachia* prevalence in arthropods can range from 19-76% but it is unlikely this has influenced BIN clustering in the *C. cuprellus* group. In a 2012 study *Wolbachia* amplicons were present in <1% of Hymenopteran trace files present on BOLD, and that value drops to 0.03 when the LepR1/LepF1 primer set was used (Smith *et al.*, 2012). It is likely that the separate BINs for specimens that key out to *C.*

cuprellus are the result of multiple cryptic species, which should be considered with future revisions of *Caenohalictus*.

The distributions of *N. apacheta* (Figure 16)*, Callonychium aricense1*, *Callonychium aricense2* (Figure 17)*,* and *Caenohalictus dolator* (Figure 18) all cross the boundary, suggested by Morrone (2006) between the Atacama and Puna biogeographic provinces (Figure 6). This suggests that a more appropriate boundary between these two biogeographic provinces would be the barrier between summer/winter rainfall.

Without time calibrated phylogenies it is not possible to determine the timing of the TVEs found here or decide whether disjunct distributions are the result of vicariance or dispersal, with the exception of the likely dispersal event of the ancestor between *N. apacheta* and [*N. longirostris* + *N. camanchaca* + *N. submersa*]. However, with future work in northern Chile it may be possible to associate vicariance or dispersal events with individual TVEs with the formation/movement of the summer/winter rain transition zone or periods of increased precipitation (Figure 5), for which more palaeoenvironmental data is needed.

This study lays the groundwork and methods that should be added to every taxonomic study undertaken in northern Chile.

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APPENDIX A: Supplementary barcode information

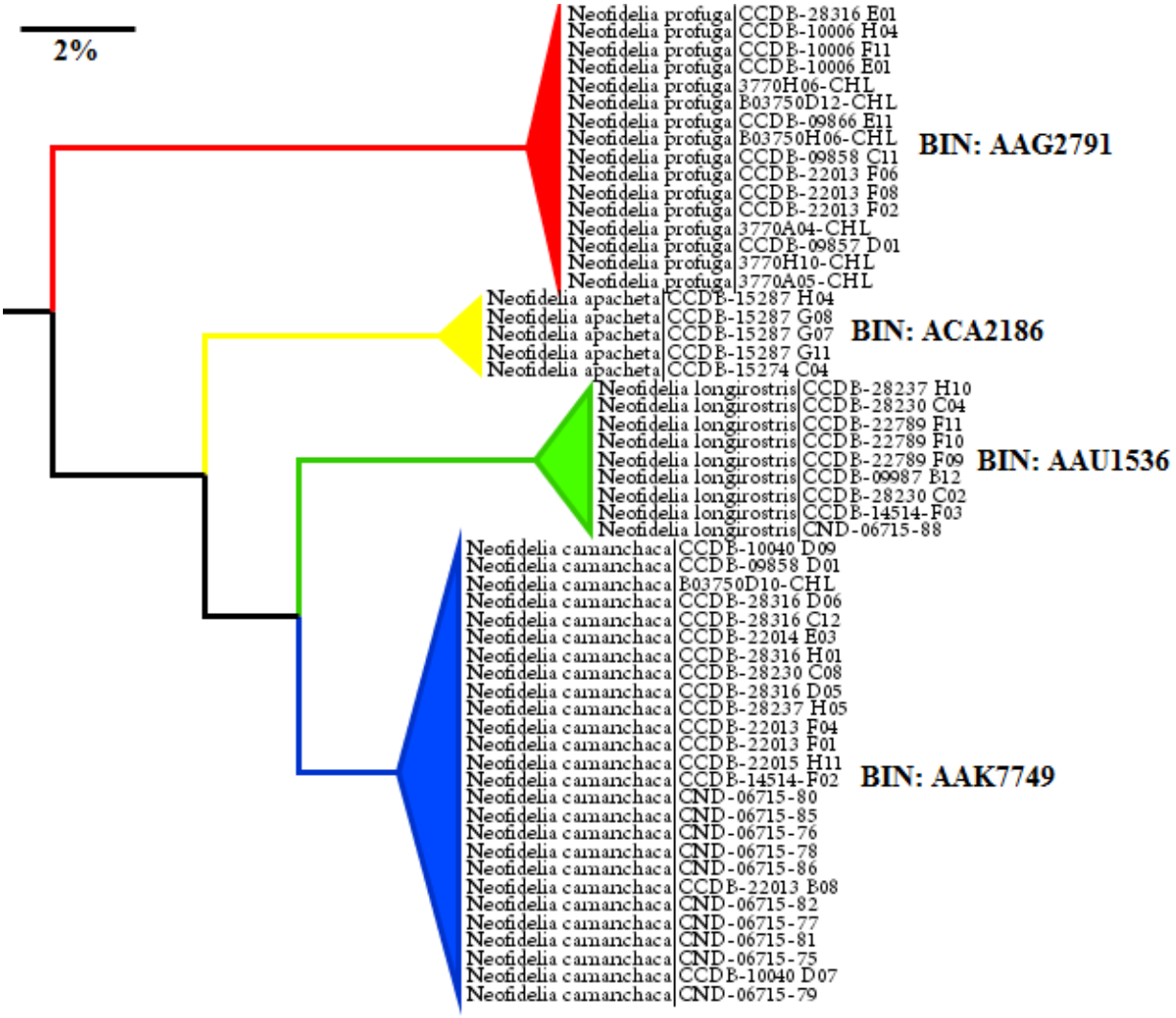

Figure S19: Neighbor joining tree, produced by BOLD, based on mtDNA CO1 sequences for *Neofidelia*. Clusters are colour coded and labeled with their associated BIN number.

Table S1: Mean and max intra-specific values for *Neofidelia* with nearest neighbour distances for each species. Minimum intra-specific value = 0%, minimum inter-specific value highlighted in blue.

Species	Mean Intra-Sp	Max Intra-Sp	Nearest Neighbour	Nearest Species	Distance to NN
Neofidelia apacheta	0.43%	1.08%	CND-06715-85	*Neofidelia camanchaca*	7.76%
Neofidelia camanchaca	0.66%	1.52%	CCDB-22789 F09	*Neofidelia longirostris*	5.93%
Neofidelia longirostris	0.50%	1.75%	CND-06715-78	*Neofidelia camanchaca*	5.93%
Neofidelia profuga	0.28%	0.81%	CCDB-15287 G08	*Neofidelia apacheta*	13.47%

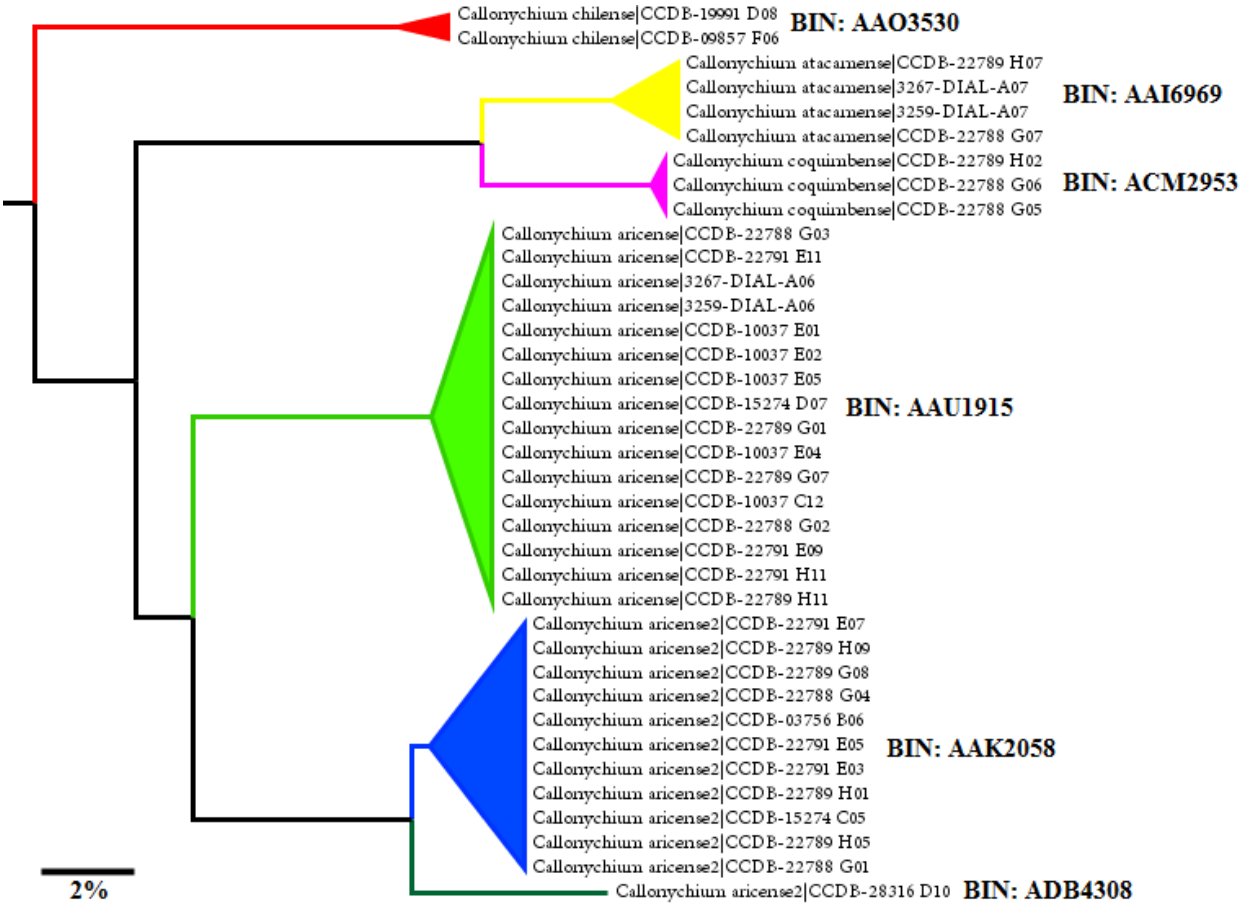

Figure S20: Neighbor joining tree, produced by BOLD, based on mtDNA CO1 sequences for *Callonychium*. Clusters are colour coded and labeled with their associated BIN number.

Table S2: Mean and max intra-specific values for *Callonychium* with nearest neighbour distances for each species. Minimum intra-specific value = 0%, minimum inter-specific value highlighted in blue.

Species	Mean Intra-Sp	Max Intra-Sp	Nearest Neighbour	Nearest Species	Distance to NN
Callonychium aricense1	1.00%	2.66%	CCDB-22791 E07	*Callonychium aricense2*	10.49%
Callonychium aricense2	1.78%	5.58%	CCDB-22789 H11	*Callonychium aricense1*	10.49%
Callonychium atacamense	1.12%	2.19%	CCDB-22788 G05	*Callonychium coquimbense*	6.31%
Callonychium chilense	1.61%	1.61%	CCDB-22791 E11	*Callonychium aricense1*	15.87%
Callonychium coquimbense	0.40%	0.50%	CCDB-22789 H07	*Callonychium atacamense*	6.31%

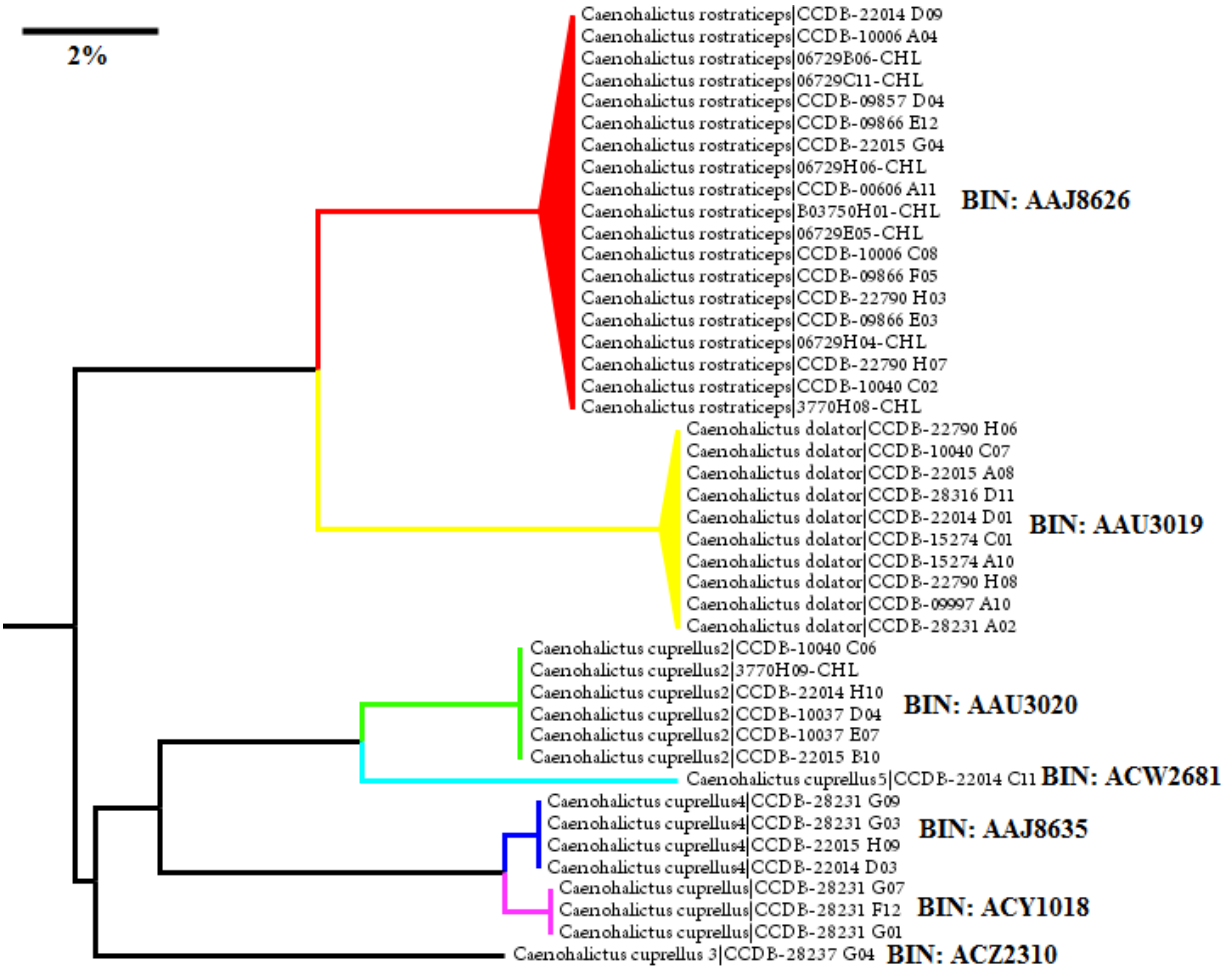

Figure S21: Neighbor joining tree, produced by BOLD, based on mtDNA CO1 sequences for *Caenohalictus*. Clusters are colour coded and labeled with their associated BIN number.

Table S3: Mean and max intra-specific values for *Callonychium* with nearest neighbour distances for each species. Minimum intra-specific value = 0%, minimum inter-specific value highlighted in blue.

Species	Mean Intra-Sp	Max Intra-Sp	Nearest Neighbour	Nearest Species	Distance to NN
Caenohalictus cuprellus5	N/A	N/A	CCDB-22014 H10	*Caenohalictus cuprellus2*	6.53%
Caenohalictus cuprellus3	N/A	N/A	CCDB-10037 E07	*Caenohalictus cuprellus2*	11.49%
Caenohalictus cuprellus2	0.00%	0.00%	CCDB-22014 C11	*Caenohalictus cuprellus5*	6.53%
Caenohalictus cuprellus4	0.00%	0.00%	CCDB-28231 G07	*Caenohalictus cuprellus1*	1.14%
Caenohalictus cuprellus1	0.00%	0.00%	CCDB-28231 G09	*Caenohalictus cuprellus4*	1.14%
Caenohalictus dolator	0.17%	0.35%	CCDB-00606 A11	*Caenohalictus rostraticeps*	8.02%
Caenohalictus rostraticeps	0.03%	0.26%	CCDB-09997 A10	*Caenohalictus dolator*	8.02%

APPENDIX B: **List of morphological characters used for phylogenetic analysis**

Females:

0. Galea: 0 = with longitudinal row of bristles on anterior margin of inner surface (Roig-Alsina & Michener, 1993: fig. 15b); 1 = without longitudinal row of bristles
1. Third labial palpomere: 0 = flattened, apically directed as is second; 1 = not flattened, laterally directed from second
2. Ligular arms: 0 = distinct from prementum (Winston, 1979: fig. 14a, b); 1 = fused with prementum (Winston, 1979: fig. 14c).
3. Subligular process of prementum: 0 = fully sclerotized and united to rest of prementum (Roig-Alsina & Michener, 1993: fig. 16); 1 = separated from rest of prementum by weak line.
4. Distal end of mentum: 0 = notched (Winston, 1979: fig. 10d); 1 = entire; 2 = Concave (Winston, 1979: fig. 10b).
5. Distal end of mentum with medial process: 0 = absent; 1 = present.
6. Mandible with upper carina, trimmal carina and fimbriate line united in a Y-shaped pattern: 0 = absent; 1 = present (Michener & Fraser, 1978: fig. 25).
7. Mandible with basal tooth (tooth of pollex): 0 = smaller than rutellum; 1 = as large as rutellum (Michener & Fraser, 1978: fig. 25).
8. Mandible with cranial condyle: 0 = contiguous with lateral clypeal margin; 1 = partly covered by lateral clypeal margin, which is usually elevated over condyle (Roig-Alsina & Michener, 1993: fig. 4).
9. Labrum anterior surface: 0 = with basal polished area, sometimes elevated, clearly delimited from punctate and hairy disk; 1 = without basal polished area.
10. Clypeal margin: 0 = not overhanging base of labrum; 1 = slightly overhanging base of labrum; 2 = strongly produced, distinctly overhanging base of labrum
11. Position of tentorial pit: 0 = on epistomal sulcus below intersection with subantennal sulcus; 1 = at the intersection of subantennal sulcus.
12. Paraocular punctuation: 0 = not differentiated from more medial part of the frons; 1 = narrow area bordering eye with punctures sparser and smaller than on the frons.
13. Interantennal distance: 0 = equal or shorter than antennocular distance; 1 = greater than antennocular distance.
14. Length of the pedicel: 0 = about as long as F1; 1 = distinctly shorter than F1.
15. Dorsal margin of pronotal collar: 0 = distinctly swollen laterally (Griswold, 1994: fig. 1); 1 = not swollen laterally.
16. Episternal groove: 0 = absent; 1 = present.
17. Parapsidal line: 0 = long (≥0.4x tegula length); 1 = short (≤0.3x tegula length).
18. Propodeal triangle with hairs: 0 = present; 1 = absent.
19. Propodeal triangle with integument: 0 = sculptured; 1 = largely smooth and shiny.

20. Stigma: 0 = Length beyond vein r less than half as long as margin basal to vein r, margin within marginal cell concave (Michener, 2007: fig. 76-1b); 1 = Length beyond vein r at least half as long as margin basal to vein r, margin within marginal cell convex or straight (Michener, 2007: fig. 68-1).
21. Apex of marginal cell: 0 = Rounded; 1 = Pointed.
22. Length of apical portion of malus of fore tibial spur: 0 = short, less than half the length of the base; 1 = long, at least half the length of the base of malus.
23. Mid tibial spur: 0 = finely serrate or ciliate; 1 = coarsely serrate.
24. Hind tibia with basitibial plate: 0 = absent; 1 = present.
25. Hind basitarsus dorsal surface in profile: 0 = straight; 1 = concave.
26. Dorsal surface of hind basitarsus: 0 = not glabrous; 1 = glabrous.
27. Colour of glabrous area of hind basitarsus: 0 = Red; 1 = Dark brown/black
28. Rows of hairs on both sides of glabrous area of hind basitarsus: 0 = pale yellow; 1 = brown/black.
29. Metatarsal claws: 0 = simple; 1 = bifurcate or cleft.
30. Coloration of metasomal terga: 0 = entirely of one color; 1 = not entirely of one color.
31. Length of S6: 0 = short, about as long as wide or shorter (length measured from apodeme to distal margin laterally); 1 = elongate, ≥1.2x longer than wide.
32. Apex of S6: 0 = pointed; 1 = truncated or rounded.
33. Spiracle of T7 hemitergite: 0 = located at or near apical third of hemitergite; 1 = located on the basal two-thirds of hemitergite length.
34. Pubescence on apex of sting gonostylus: 0 = densely covered by long plumose hairs (≥1.2x gonostylar width); 1 = nearly hairless to sparsely covered by short hairs (≤ maximum gonostylus width in lateral view).

Males:

35. First and second labial palpomeres: 0 = second equal to or longer than first; 1 = first longer than second.
36. Mandible: 0 = with three teeth; 1 = edentate (without subapical tooth); 2 = with two teeth.
37. Clypeus protuberant in front of compound eye: 0 = < 1.1x eye width (Dumesh & Packer, 2013: fig. 24); 1 = >1.3x eye width (Dumesh & Packer, 2013: fig. 23).
38. Colour of clypeus: 0 = concolorus with rest of the face; 1 = yellow or pale, not concolorus with rest of the face.
39. Basal border of clypeus: 0 = separated from antennal socket by < the width of the socket; 1 = separated from antennal socket by > the width of the socket.
40. Anterior dorsal ridge of third phragma, in dorsal view: 0 = absent; 1 = present.
41. Number of submarginal cells: 0 = two; 1 = three.
42. Posterior apical process of trochanter: 0 = absent; 1 = present.
43. Hind femur: 0 = unmodified; 1 = swollen (<3x longer than broad).

44. Apical angle on hind femur: 0 = absent; 1 = obtuse; 2 = right angular to acute (Dumesh & Packer, 2013: fig. 16).
45. Hind basitarsus: 0 = unmodified; 1 = forming two curved talons.
46. Pygidial plate: 0 = absent; 1 = present.
47. Apex of Pygidial plate: 0 = truncate; 1 = rounded.
48. T7 with medial apical spines: 0 = absent; 1 = present.
49. Anterior margin of S7 with medial cleft: 0 = absent; 1 = present.
50. Spine on posterior margin of S7: 0 = absent; 1 = present.
51. Anteriorly directed spines on distolateral margin of S7: 0 = absent; 1 = present.
52. Length of S8: 0 = about as long as broad or shorter (Michener, 2007: fig. 82-2g); 1 = ≥1.3x longer than broad (Michener, 2007: fig. 81-11b).
53. Distal portion of S8 forming: 0 = single apical lobe; 1 = two lateral lobes
54. Apicolateral margin of S8: 0 = slightly to strongly concave (Dumesh and Packer, 2013: figs. 20, 28); 1 = convex (Dumesh and Packer, 2013: fig. 13).
55. Gonobase: 0 = present, forming a complete ring, ventrally narrower (Michener, 2007: fig. 84-10a); 1 = present, forming a complete ring, well developed ventrally (Michener, 2007: fig. 80-4c).
56. Gonostylus with apex (in ventral view): 0 = short, not reaching apex of penis valves; 1 = reaching about the same level as apex of penis valves; 2 = well surpassing apex of penis valves.
57. Apex of gonostylus (in ventral view): 0 = straight to laterally curved; 1 = curved, medially directed.
58. Penis valves: 0 = simple; 1 = expanded in apical half.

APPENDIX C: Data matrix

Table S4: Morphological character matrix used for the phylogenetic analysis of *Neofidelia.*

	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29
Lithurgus spiniferus	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	?	?	0
Pararhophites quadratus	0	1	0	0	1	?	0	0	0	0	2	0	0	1	0	0	0	1	0	0	1	0	1	1	1	0	0	?	?	1
Fidelia villosa	1	1	1	1	2	0	1	1	1	0	1	0	0	1	1	0	1	0	0	1	0	1	0	1	1	0	0	?	?	0
Fidelia hessei	1	1	1	1	2	0	1	1	1	?	1	1	0	1	1	0	1	0	0	0	0	1	1	1	1	0	0	?	?	1
Neofidelia profuga	1	1	1	0	2	1	1	0	0	1	1	1	1	1	1	1	1	1	1	1	0	1	1	1	1	1	1	0	1	1
Neofidelia apacheta	1	1	1	0	2	1	1	0	0	1	1	1	1	1	1	1	1	1	1	0	1	1	1	1	1	1	1	1	0	1
Neofidelia longirostris	1	1	1	0	2	1	1	0	0	1	1	1	1	1	1	1	1	1	1	0	1	1	1	1	1	0	1	1	0	1
Neofidelia submersa	1	1	1	0	2	1	1	0	0	1	1	1	1	1	1	1	1	1	1	0	1	1	1	1	1	0	1	1	0	1
Neofidelia camanchaca	1	1	1	0	2	1	1	0	0	1	1	1	1	1	1	1	1	1	1	0	1	1	1	1	1	0	1	1	1	1

(Continued)

	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58
Lithurgus spiniferus	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	?	0	0	0	0	0	0	0	0	0	0	0
Pararhophites quadratus	1	0	1	1	1	0	1	0	1	1	?	0	0	0	0	0	0	?	0	0	0	0	0	0	1	0	2	0	1
Fidelia villosa	1	1	1	1	0	0	2	0	1	1	?	1	0	0	0	0	0	?	1	0	0	1	1	1	?	0	2	0	0
Fidelia hessei	1	?	1	1	0	0	2	0	0	1	?	1	0	0	0	0	1	0	1	0	0	1	1	1	?	0	2	0	0
Neofidelia profuga	1	1	1	1	0	2	2	0	0	0	0	1	1	1	2	1	1	1	0	0	0	0	1	0	0	1	1	2	1
Neofidelia apacheta	1	1	1	1	1	0	2	0	0	1	1	1	1	1	1	1	1	0	0	1	0	0	1	0	1	1	1	2	1
Neofidelia longirostris	1	1	1	1	1	2	2	0	0	1	1	1	1	1	2	1	1	1	0	1	1	0	1	0	0	1	1	2	1
Neofidelia submersa	1	0	1	1	0	?	2	1	0	1	?	1	1	1	2	1	1	1	0	1	1	0	1	0	0	1	1	2	1
Neofidelia camanchaca	1	1	1	1	0	2	2	1	0	1	1	1	1	1	1	1	1	1	0	1	1	0	1	0	0	1	1	2	1

APPENDIX D: List of specimens

Table S5: *Neofidelia* species examined for phylogenetic analysis.

Species	Sex	Region	Locality	Lat.	Long	Elev. (m)	Date 1	Date 2	Collector(s)	Barcode #	Collection
N. apacheta	M	I	73 km E of Pozo Almonte	-20.31233	-69.12930	3137	16.iv	21.iv.2012	L. Packer		PCYU
N. apacheta	M	I	73 km E of Pozo Almonte	-20.31233	-69.12930	3137	16.iv	21.iv.2012	L. Packer		PCYU
N. apacheta	M	I	73 km E of Pozo Almonte	-20.31233	-69.12930	3137	16.iv	21.iv.2012	L. Packer		PCYU
N. apacheta	F	I	73 km E of Pozo Almonte	-20.31233	-69.12930	3137	16.iv	21.iv.2012	L. Packer		PCYU
N. apacheta	F	I	73 km E of Pozo Almonte	-20.31233	-69.12930	3137	16.iv	21.iv.2012	L. Packer		PCYU
N. apacheta	F	I	73 km E of Pozo Almonte	-20.31233	-69.12930	3137	16.iv	21.iv.2012	L. Packer		PCYU
N. apacheta	M	I	73 km E of Pozo Almonte	-20.31233	-69.12930	3137	16.iv	21.iv.2012	L. Packer		PCYU
N. apacheta	F	I	E of Pozo Almonte	-20.29732	-69.14233	2969	16.iv	21.iv.2012	L. Packer		PCYU
N. apacheta	F	I	E of Pozo Almonte	-20.29732	-69.14233	2969	16.iv	21.iv.2012	L. Packer		PCYU
N. apacheta	M	I	E of Pozo Almonte	-20.29732	-69.14233	2969	16.iv	21.iv.2012	L. Packer		PCYU
N. apacheta	M	I	62 km E of Pozo Almonte	-20.28928	-69.21951	2464	21.iv	10.v.2012	L. Packer		PCYU
N. apacheta	F	I	62 km E of Pozo Almonte	-20.28928	-69.21951	2464	21.iv	10.v.2012	L. Packer		PCYU
N. apacheta	M	I	62 km E of Pozo Almonte	-20.28928	-69.21951	2464	21.iv	10.v.2012	L. Packer		PCYU
N. apacheta	M	I	62 km E of Pozo Almonte	-20.28928	-69.21951	2464	21.iv	10.v.2012	L. Packer		PCYU
N. apacheta	F	I	62 km E of Pozo Almonte	-20.28928	-69.21951	2464	21.iv	10.v.2012	L. Packer		PCYU
N. apacheta	F	I	62 km E of Pozo Almonte	-20.28928	-69.21951	2464	21.iv	10.v.2012	L. Packer		PCYU
N. apacheta	F	I	62 km E of Pozo Almonte	-20.28928	-69.21951	2464	21.iv	10.v.2012	L. Packer		PCYU
N. apacheta	F	I	62 km E of Pozo Almonte	-20.28928	-69.21951	2464	21.iv	10.v.2012	L. Packer		PCYU
N. apacheta	F	I	62 km E of Pozo Almonte	-20.28928	-69.21951	2464	21.iv	10.v.2012	L. Packer		PCYU
N. apacheta	F	I	62 km E of Pozo Almonte	-20.28928	-69.21951	2464	21.iv	10.v.2012	L. Packer		PCYU
N. apacheta	M	I	62 km E of Pozo Almonte	-20.28928	-69.21951	2464	21.iv	10.v.2012	L. Packer		PCYU
N. apacheta	M	I	62 km E of Pozo Almonte	-20.28928	-69.21951	2464	21.iv	10.v.2012	L. Packer		PCYU
N. apacheta	M	I	62 km E of Pozo Almonte	-20.28928	-69.21951	2464	21.iv	10.v.2012	L. Packer		PCYU
N. apacheta	M	I	62 km E of Pozo Almonte	-20.28928	-69.21951	2464	21.iv	10.v.2012	L. Packer		PCYU
N. apacheta	F	I	62 km E of Pozo Almonte	-20.28928	-69.21951	2464	21.iv	10.v.2012	L. Packer		PCYU
N. apacheta	F	I	62 km E of Pozo Almonte	-20.28928	-69.21951	2464	21.iv	10.v.2012	L. Packer		PCYU
N. apacheta	F	I	62 km E of Pozo Almonte	-20.28928	-69.21951	2464	21.iv	10.v.2012	L. Packer		PCYU
N. apacheta	F	I	62 km E of Pozo Almonte	-20.28928	-69.21951	2464	21.iv	10.v.2012	L. Packer		PCYU
N. apacheta	F	I	62 km E of Pozo Almonte	-20.28928	-69.21951	2464	21.iv	10.v.2012	L. Packer		PCYU
N. apacheta	F	I	62 km E of Pozo Almonte	-20.28928	-69.21951	2464	15.iv	16.iv.2012	L. Packer		PCYU
N. apacheta	F	I	62 km E of Pozo Almonte	-20.28928	-69.21951	2464	21.iv	10.v.2012	L. Packer		PCYU
N. apacheta	F	I	62 km E of Pozo Almonte	-20.28928	-69.21951	2464	21.iv	10.v.2012	L. Packer		PCYU
N. apacheta	F	I	62 km E of Pozo Almonte	-20.28928	-69.21951	2464	21.iv	10.v.2012	L. Packer		PCYU
N. apacheta	F	I	62 km E of Pozo Almonte	-20.28928	-69.21951	2464	21.iv	10.v.2012	L. Packer		PCYU
N. apacheta	F	I	62 km E of Pozo Almonte	-20.28928	-69.21951	2464	15.iv	16.iv.2012	L. Packer		PCYU
N. apacheta	F	I	62 km E of Pozo Almonte	-20.28928	-69.21951	2464	15.iv	16.iv.2012	L. Packer		PCYU
N. apacheta	F	I	62 km E of Pozo Almonte	-20.28928	-69.21951	2464	21.iv	10.v.2012	L. Packer		PCYU
N. apacheta	F	I	62 km E of Pozo Almonte	-20.28928	-69.21951	2464	21.iv	10.v.2012	L. Packer		PCYU
N. apacheta	F	I	62 km E of Pozo Almonte	-20.28928	-69.21951	2464	21.iv	10.v.2012	L. Packer		PCYU
N. apacheta	F	I	62 km E of Pozo Almonte	-20.28928	-69.21951	2464	21.iv	10.v.2012	L. Packer		PCYU
N. apacheta	F	I	62 km E of Pozo Almonte	-20.28928	-69.21951	2464	21.iv	10.v.2012	L. Packer		PCYU
N. apacheta	F	I	62 km E of Pozo Almonte	-20.28928	-69.21951	2464	21.iv	10.v.2012	L. Packer		PCYU

N. apacheta	F	I	62 km E of Pozo Almonte	-20.28928	-69.21951	2464	21.iv	10.v.2012	L. Packer	PCYU
N. apacheta	F	I	62 km E of Pozo Almonte	-20.28928	-69.21951	2464	15.iv	16.iv.2012	L. Packer	PCYU
N. apacheta	F	I	62 km E of Pozo Almonte	-20.28928	-69.21951	2464	21.iv	10.v.2012	L. Packer	PCYU
N. apacheta	F	I	62 km E of Pozo Almonte	-20.28928	-69.21951	2464	21.iv	10.v.2012	L. Packer	PCYU
N. apacheta	F	I	62 km E of Pozo Almonte	-20.28928	-69.21951	2464	21.iv	10.v.2012	L. Packer	PCYU
N. apacheta	F	I	62 km E of Pozo Almonte	-20.28928	-69.21951	2464	21.iv	10.v.2012	L. Packer	PCYU
N. apacheta	F	I	62 km E of Pozo Almonte	-20.28928	-69.21951	2464	21.iv	10.v.2012	L. Packer	PCYU
N. apacheta	F	I	62 km E of Pozo Almonte	-20.28928	-69.21951	2464	21.iv	10.v.2012	L. Packer	PCYU
N. apacheta	F	I	62 km E of Pozo Almonte	-20.28928	-69.21951	2464	15.iv	16.iv.2012	L. Packer	PCYU
N. apacheta	F	I	62 km E of Pozo Almonte	-20.28928	-69.21951	2464	15.iv	16.iv.2012	L. Packer	PCYU
N. apacheta	F	I	62 km E of Pozo Almonte	-20.28928	-69.21951	2464	21.iv	10.v.2012	L. Packer	PCYU
N. apacheta	F	I	62 km E of Pozo Almonte	-20.28928	-69.21951	2464	21.iv	10.v.2012	L. Packer	PCYU
N. apacheta	F	I	62 km E of Pozo Almonte	-20.28928	-69.21951	2464	15.iv	16.iv.2012	L. Packer	PCYU
N. apacheta	F	I	62 km E of Pozo Almonte	-20.28928	-69.21951	2464	15.iv	16.iv.2012	L. Packer	PCYU
N. apacheta	F	I	62 km E of Pozo Almonte	-20.28928	-69.21951	2464	21.iv	10.v.2012	L. Packer	PCYU
N. apacheta	F	I	62 km E of Pozo Almonte	-20.28928	-69.21951	2464	21.iv	10.v.2012	L. Packer	PCYU
N. apacheta	M	I	62 km E of Pozo Almonte	-20.28928	-69.21951	2464	21.iv	10.v.2012	L. Packer	PCYU
N. apacheta	F	I	62 km E of Pozo Almonte	-20.28928	-69.21951	2464	21.iv	10.v.2012	L. Packer	PCYU
N. apacheta	F	I	62 km E of Pozo Almonte	-20.28928	-69.21951	2464	21.iv	10.v.2012	L. Packer	PCYU
N. apacheta	F	I	62 km E of Pozo Almonte	-20.28928	-69.21951	2464	15.iv	16.iv.2012	L. Packer	PCYU
N. apacheta	F	I	62 km E of Pozo Almonte	-20.28928	-69.21951	2464	21.iv	10.v.2012	L. Packer	PCYU
N. apacheta	F	I	62 km E of Pozo Almonte	-20.28928	-69.21951	2464	21.iv	10.v.2012	L. Packer	PCYU
N. apacheta	F	I	62 km E of Pozo Almonte	-20.28928	-69.21951	2464	21.iv	10.v.2012	L. Packer	PCYU
N. apacheta	F	I	62 km E of Pozo Almonte	-20.28928	-69.21951	2464	21.iv	10.v.2012	L. Packer	PCYU
N. apacheta	F	I	62 km E of Pozo Almonte	-20.28928	-69.21951	2464	21.iv	10.v.2012	L. Packer	PCYU
N. apacheta	F	I	62 km E of Pozo Almonte	-20.28928	-69.21951	2464	15.iv	16.iv.2012	L. Packer	PCYU
N. apacheta	F	I	62 km E of Pozo Almonte	-20.28928	-69.21951	2464	15.iv	16.iv.2012	L. Packer	PCYU
N. apacheta	F	I	62 km E of Pozo Almonte	-20.28928	-69.21951	2464	21.iv	10.v.2012	L. Packer	PCYU
N. apacheta	F	I	62 km E of Pozo Almonte	-20.28928	-69.21951	2464	15.iv	16.iv.2012	L. Packer	PCYU
N. apacheta	F	I	S of Cerro Colorado	-20.08888	-69.28450	2386	21.iv	10.v.2012	L. Packer	PCYU
N. apacheta	F	I	S of Cerro Colorado	-20.08888	-69.28450	2386	21.iv	10.v.2012	L. Packer	PCYU
N. apacheta	M	I	S of Cerro Colorado	-20.08888	-69.28450	2386	21.iv	10.v.2012	L. Packer	PCYU
N. apacheta	F	I	S of Cerro Colorado	-20.08888	-69.28450	2386	21.iv	10.v.2012	L. Packer	PCYU
N. apacheta	F	I	S of Cerro Colorado	-20.08888	-69.28450	2386	21.iv	10.v.2012	L. Packer	PCYU
N. apacheta	F	I	S of Cerro Colorado	-20.08888	-69.28450	2386	21.iv	10.v.2012	L. Packer	PCYU
N. apacheta	F	I	S of Cerro Colorado	-20.08888	-69.28450	2386	21.iv	10.v.2012	L. Packer	PCYU
N. apacheta	F	I	S of Cerro Colorado	-20.08888	-69.28450	2386	21.iv	10.v.2012	L. Packer	PCYU
N. apacheta	F	I	Mamiña vertedero	-20.06175	-69.21810	2660	16.iv	21.iv.2012	L. Packer	PCYU
N. apacheta	F	I	Mamiña vertedero	-20.06175	-69.21810	2660	16.iv	21.iv.2012	L. Packer	PCYU
N. apacheta	F	I	Mamiña vertedero	-20.06175	-69.21810	2660	16.iv	21.iv.2012	L. Packer	PCYU
N. apacheta	F	I	Mamiña vertedero	-20.06175	-69.21810	2660	16.iv	21.iv.2012	L. Packer	PCYU
N. apacheta	F	I	Mamiña vertedero	-20.06175	-69.21810	2660	16.iv	21.iv.2012	L. Packer	PCYU
N. apacheta	F	I	Mamiña vertedero	-20.06175	-69.21810	2660	16.iv	21.iv.2012	L. Packer	PCYU
N. apacheta	M	I	Mamiña vertedero	-20.06175	-69.21810	2660	16.iv	21.iv.2012	L. Packer	PCYU
N. apacheta	M	I	4 km W of Mamiña	-20.03671	-69.23058	2683	16.iv	21.iv.2012	L. Packer	PCYU
N. apacheta	M	I	4 km W of Mamiña	-20.03671	-69.23058	2683	16.iv	21.iv.2012	L. Packer	PCYU
N. apacheta	M	I	4 km W of Mamiña	-20.03671	-69.23058	2683	16.iv	21.iv.2012	L. Packer	PCYU
N. apacheta	M	I	4 km W of Mamiña	-20.03671	-69.23058	2683	16.iv	21.iv.2012	L. Packer	PCYU
N. apacheta	M	I	4 km W of Mamiña	-20.03671	-69.23058	2683	16.iv	21.iv.2012	L. Packer	PCYU

N. apacheta	M	I	4 km W of Mamiña	-20.03671	-69.23058	2683	16.iv	21.iv.2012	L. Packer		PCYU
N. apacheta	M	I	4 km W of Mamiña	-20.03671	-69.23058	2683	16.iv	21.iv.2012	L. Packer		PCYU
N. apacheta	M	I	4 km W of Mamiña	-20.03671	-69.23058	2683	16.iv	21.iv.2012	L. Packer		PCYU
N. apacheta	F	I	4 km W of Mamiña	-20.03671	-69.23058	2683	16.iv	21.iv.2012	L. Packer		PCYU
N. apacheta	F	I	4 km W of Mamiña	-20.03671	-69.23058	2683	16.iv	21.iv.2012	L. Packer		PCYU
N. apacheta	F	I	4 km W of Mamiña	-20.03671	-69.23058	2683	16.iv	21.iv.2012	L. Packer		PCYU
N. apacheta	F	I	4 km W of Mamiña	-20.03671	-69.23058	2683	16.iv	21.iv.2012	L. Packer		PCYU
N. apacheta	F	I	4 km W of Mamiña	-20.03671	-69.23058	2683	16.iv	21.iv.2012	L. Packer		PCYU
N. apacheta	F	I	4 km W of Mamiña	-20.03671	-69.23058	2683	16.iv	21.iv.2012	L. Packer		PCYU
N. apacheta	F	I	4 km W of Mamiña	-20.03671	-69.23058	2683	16.iv	21.iv.2012	L. Packer		PCYU
N. apacheta	F	I	4 km W of Mamiña	-20.03671	-69.23058	2683	16.iv	21.iv.2012	L. Packer		PCYU
N. apacheta	F	I	4 km W of Mamiña	-20.03671	-69.23058	2683	16.iv	21.iv.2012	L. Packer		PCYU
N. apacheta	F	I	4 km W of Mamiña	-20.03671	-69.23058	2683	16.iv	21.iv.2012	L. Packer		PCYU
N. apacheta	F	I	4 km W of Mamiña	-20.03671	-69.23058	2683	16.iv	21.iv.2012	L. Packer		PCYU
N. apacheta	F	I	4 km W of Mamiña	-20.03671	-69.23058	2683	16.iv	21.iv.2012	L. Packer		PCYU
N. apacheta	F	I	4 km W of Mamiña	-20.03671	-69.23058	2683	16.iv	21.iv.2012	L. Packer		PCYU
N. apacheta	F	I	4 km W of Mamiña	-20.03671	-69.23058	2683	16.iv	21.iv.2012	L. Packer		PCYU
N. apacheta	F	I	4 km W of Mamiña	-20.03671	-69.23058	2683	16.iv	21.iv.2012	L. Packer		PCYU
N. apacheta	F	I	4 km W of Mamiña	-20.03671	-69.23058	2683	16.iv	21.iv.2012	L. Packer		PCYU
N. apacheta	F	I	4 km W of Mamiña	-20.03671	-69.23058	2683	16.iv	21.iv.2012	L. Packer		PCYU
N. apacheta	F	I	4 km W of Mamiña	-20.03671	-69.23058	2683	16.iv	21.iv.2012	L. Packer		PCYU
N. apacheta	F	I	4 km W of Mamiña	-20.03671	-69.23058	2683	16.iv	21.iv.2012	L. Packer		PCYU
N. apacheta	F	I	4 km W of Mamiña	-20.03671	-69.23058	2683	16.iv	21.iv.2012	L. Packer		PCYU
N. apacheta	F	I	4 km W of Mamiña	-20.03671	-69.23058	2683	16.iv	21.iv.2012	L. Packer		PCYU
N. apacheta	F	I	4 km W of Mamiña	-20.03671	-69.23058	2683	16.iv	21.iv.2012	L. Packer		PCYU
N. apacheta	F	I	4 km W of Mamiña	-20.03671	-69.23058	2683	16.iv	21.iv.2012	L. Packer		PCYU
N. apacheta	F	I	4 km W of Mamiña	-20.03671	-69.23058	2683	16.iv	21.iv.2012	L. Packer		PCYU
N. apacheta	M	I	4 km W of Mamiña	-20.03671	-69.23058	2683	16.iv	21.iv.2012	L. Packer		PCYU
N. apacheta	F	I	4 km W of Mamiña	-20.03671	-69.23058	2683	21.iv	10.v.2012	L. Packer		PCYU
N. apacheta	F	I	4 km W of Mamiña	-20.03671	-69.23058	2683	21.iv	10.v.2012	L. Packer		PCYU
N. apacheta	M	I	4 km W of Mamiña	-20.03671	-69.23058	2683	21.iv	10.v.2012	L. Packer		PCYU
N. apacheta	M	I	4 km W of Mamiña	-20.03671	-69.23058	2683	21.iv	10.v.2012	L. Packer		PCYU
N. apacheta	F	I	4 km W of Mamiña	-20.03671	-69.23058	2683	16.iv	21.iv.2012	L. Packer		PCYU
N. apacheta	F	XV	Hwy 31, km 55.6, Pampa de Chaca	-18.74978	-69.78452	2989	20.iv	11.v.2012	L. Packer		PCYU
N. apacheta	F	XV	55.6 km, Pampa de Chaca	-18.74355	-69.84498	1935	19.iv	12.v.2012	L. Packer		PCYU
N. apacheta	F	XV	55.6 km, Pampa de Chaca	-18.74355	-69.84498	1935	19.iv	12.v.2012	L. Packer		PCYU
N. apacheta	F	XV	55.6 km, Pampa de Chaca	-18.74355	-69.84498	1935	19.iv	12.v.2012	L. Packer		PCYU
N. apacheta	F	XV	55.6 km, Pampa de Chaca	-18.74355	-69.84498	1935	19.iv	12.v.2012	L. Packer		PCYU
N. apacheta	F	XV	55.6 km, Pampa de Chaca	-18.74355	-69.84498	1935	19.iv	12.v.2012	L. Packer		PCYU
N. apacheta	F	XV	Hwy 31, km 59, Pampa de Chaca	-18.73617	-69.75206	2175	20.iv	11.v.2012	L. Packer		PCYU
N. apacheta	F	XV	Hwy 31, km 59, Pampa de Chaca	-18.73617	-69.75206	2175	20.iv	11.v.2012	L. Packer		PCYU
N. apacheta	M	XV	W of Planta Quiborax	-18.44600	-69.88800	1651	13.v.2012		L. Packer	CCDB-15287 H04	PCYU
N. apacheta	F	XV	W of Planta Quiborax	-18.44600	-69.88800	1651	13.v.2012		L. Packer	CCDB-15287 G08	PCYU
N. apacheta	F	XV	W of Planta Quiborax	-18.44600	-69.88800	1651	13.v.2012		L. Packer	CCDB-15287 G07	PCYU
N. apacheta	F	XV	W of Planta Quiborax	-18.44600	-69.88800	1651	13.v.2012		L. Packer	CCDB-15287 G11	PCYU
N. apacheta	F	XV	Planta Quiborax	-18.44193	-69.89268	1660	19.iv	16.v.2012	L. Packer		PCYU
N. apacheta	F	XV	Hwy 11, km 65	-18.43821	-69.89668	1877	17.iv	19.iv.2012	L. Packer	CCDB-15274 C04	PCYU
N. camanchaca	F	I	Alto Patache	-20.82600	-70.15400	808	15.xii.2015		Packer & Larrain	CCDB-28316 D05	PCYU
N. camanchaca	M	I	Alto Patache	-20.82600	-70.15400	808	24.x.2015		L. Packer	CCDB-28316 C12	PCYU

N. camanchaca	F	II	Rt 1, 15 km N of Taltal	-25.27824	-70.44476	16	15.x.2010		L Packer & E Almeida	CCDB-22013 B08	PCYU
N. camanchaca	F	II	29 km N. of Paposo	-24.78304	-70.54024	59	29.x.2014		J. Postlethwaite		PCYU
N. camanchaca	F	II	29 km N. of Paposo	-24.78304	-70.54024	59	21.x	30.x.2014	J. Postlethwaite	CCDB-28237 H05	PCYU
N. camanchaca	F	II	29 km N. of Paposo	-24.78304	-70.54024	59	21.x	30.x.2014	J. Postlethwaite	CCDB-22013 F04	PCYU
N. camanchaca	F	II	29 km N. of Paposo	-24.78304	-70.54024	59	21.x	2.xii.2014	J. Postlethwaite, L. Packer		PCYU
N. camanchaca	F	II	29 km N. of Paposo	-24.78304	-70.54024	59	24.x.2014		J. Postlethwaite		PCYU
N. camanchaca	F	II	29 km N. of Paposo	-24.78304	-70.54024	59	24.x.2014		J. Postlethwaite	CCDB-22009 C07	PCYU
N. camanchaca	F	II	35 km N. of Paposo	-24.73706	-70.56628	43	21.x	2.xii.2014	J. Postlethwaite		PCYU
N. camanchaca	F	II	35 km N. of Paposo	-24.73706	-70.56628	43	21.x	2.xii.2014	J. Postlethwaite, L. Packer	CCDB-28230 C08	PCYU
N. camanchaca	M	II	N of Paposo	-24.73601	-70.56727	44	20.iv	7.v.2015	Laurence & Laurel Packer	CCDB-22014 E03	PCYU
N. camanchaca	F	II	N of Paposo	-24.73601	-70.56727	44	20.iv	7.v.2015	Laurence & Laurel Packer	CCDB-22013 F01	PCYU
N. camanchaca	F	II	9 km E of Antofagasta	-23.70786	-70.38490	250	30.x.2015		L. Packer		PCYU
N. camanchaca	F	II	9 km E of Antofagasta	-23.70786	-70.38490	250	30.x.2015		L. Packer		PCYU
N. camanchaca	M	II	9 km E of Antofagasta	-23.70786	-70.38490	250	30.x.2015		L. Packer		PCYU
N. camanchaca	M	II	9 km E of Antofagasta	-23.70786	-70.38490	250	30.x.2015		L. Packer		PCYU
N. camanchaca	M	II	9 km E of Antofagasta	-23.70786	-70.38490	250	30.x.2015		L. Packer		PCYU
N. camanchaca	M	II	9 km E of Antofagasta	-23.70786	-70.38490	250	30.x.2015		L. Packer		PCYU
N. camanchaca	M	II	9 km E of Antofagasta	-23.70786	-70.38490	250	30.x.2015		L. Packer		PCYU
N. camanchaca	F	II	NE Antofagasta	-23.49783	-70.37527	451	21.x.2015		L. Packer	CCDB-28316 H01	PCYU
N. camanchaca	M	II	NE Antofagasta	-23.49783	-70.37527	451	21.x.2015		L. Packer	CCDB-28316 D05	PCYU
N. camanchaca	F	II	NE Antofagasta	-23.49783	-70.37527	451	21.x.2015		L. Packer		PCYU
N. camanchaca	M	II	NE Antofagasta	-23.49783	-70.37527	451	21.x.2015		L. Packer		PCYU
N. camanchaca	M	II	NE Antofagasta	-23.49783	-70.37527	451	21.x.2015		L. Packer		PCYU
N. camanchaca	M	II	NE Antofagasta	-23.49783	-70.37527	451	21.x.2015		L. Packer		PCYU
N. camanchaca	M	II	NE Antofagasta	-23.49783	-70.37527	451	21.x.2015		L. Packer		PCYU
N. camanchaca	F	II	NE Antofagasta	-23.49783	-70.37527	451	21.x.2015		L. Packer		PCYU
N. camanchaca	M	II	20-40 km N of Paposo				28.x	30.x.1983	Luis E. Peña		PCYU
N. camanchaca	M	III	Flamenco, Hwy 5	-26.57330	-70.68250		17.x.2009		J. Gibbs		PCYU
N. camanchaca	M	III	Flamenco, Hwy 5	-26.57330	-70.68250		17.x.2009		J. Gibbs		PCYU
N. camanchaca	M	III	Flamenco, Hwy 5	-26.57330	-70.68250		17.x.2009		J. Gibbs	B03750 D10	PCYU
N. camanchaca	F	III	Panamericana km 1005, Chañaral	-26.35000	-70.63000		24.x.2000		L. Packer	CDN-06715-86	PCYU
N. camanchaca	F	III	Panamericana km 1005, Chañaral	-26.35000	-70.63000		24.x.2000		L. Packer	CCDB-03770 H07	PCYU
N. camanchaca	F	III	Panamericana km 1005, Chañaral	-26.35000	-70.63000		24.x.2000		L. Packer	CDN-06715-84	PCYU
N. camanchaca	M	III	Chañaral Hwy 5, km 1006	-26.25000	-70.48000		10.xi.2002		J Grixti & A Zayed	CDN-06715-81	PCYU
N. camanchaca	F	III	Chañaral Hwy 5, km 1006	-26.25000	-70.48000		10.xi.2002		J Grixti & A Zayed	CDN-06715-82	PCYU
N. camanchaca	F	III	Chañaral Hwy 5, km 1006	-26.25000	-70.48000		10.xi.2002		J Grixti & A Zayed	CDN-06715-80	PCYU
N. camanchaca	F	III	Chañaral Hwy 5, km 1006	-26.25000	-70.48000		10.xi.2002		J Grixti & A Zayed	CDN-06715-79	PCYU
N. camanchaca	M	III	E of Pan de Azucar	-26.06068	-70.51685	355	16.v.2010		L Packer & E Almeida		PCYU
N. camanchaca	M	III	E of Pan de Azucar	-26.06067	-70.51684	365	18.x.2010		L Packer & E Almeida	CDN-06715-76	PCYU
N. camanchaca	M	III	E of Pan de Azucar	-26.06067	-70.51684	365	18.x.2010		L Packer & E Almeida	CDN-06715-77	PCYU
N. camanchaca	F	III	E of Pan de Azucar	-26.06067	-70.51684	365	18.x.2010		L Packer & E Almeida	CDN-06715-78	PCYU
N. camanchaca	M	III	E of Pan de Azucar	-26.06067	-70.51684	365	18.x.2010		L Packer & E Almeida	CDN-06715-75	PCYU
N. camanchaca	F	III	N of Pan de Azucar	-25.98800	-70.44300		3.x.2002		J Grixti & A Zayed	CDN-06715-85	PCYU
N. longirostris	M	III	10km N of Vallenar	-28.46000	-70.73000		18.x.2000		L. Packer	CDN-06715-83	PCYU
N. longirostris	F	III	Posada Elsa, N of Vallenar	-28.15000	-70.63000		11.x.2000		L. Packer	CDN-06715-89	PCYU
N. longirostris	F	III	Posada Elsa, N of Vallenar	-28.15000	-70.63000		11.x.2000		L. Packer		PCYU
N. longirostris	F	III	N of Vallenar	-28.01883	-70.55381		11.x	12.x.2000	L. Packer	CDN-06715-88	PCYU
N. longirostris	F	III	N of Vallenar	-28.01883	-70.55381		11.x	12.x.2000	L. Packer	CCDB-28237 H07	PCYU
N. longirostris	F	III	33km N. of Puerto Viejo	-27.11502	-70.84856	12	17.x	30.xi.2014	J. Postlethwaite, L. Packer		PCYU

N. longirostris	M	III	Caldera	-27.06306	-70.81092	13	17.x	30.xi.2014	J. Postlethwaite		PCYU
N. longirostris	M	III	Caldera	-27.06306	-70.81092	13	17.x	30.xi.2014	J. Postlethwaite		PCYU
N. longirostris	M	III	Caldera	-27.06306	-70.81092	13	17.x	30.xi.2014	J. Postlethwaite		PCYU
N. longirostris	M	III	Caldera	-27.06306	-70.81092	13	17.x	30.xi.2014	J. Postlethwaite		PCYU
N. longirostris	F	III	Caldera	-27.06306	-70.81092	13	17.x	30.xi.2014	J. Postlethwaite		PCYU
N. longirostris	F	III	Caldera	-27.06306	-70.81092	13	17.x	30.xi.2014	J. Postlethwaite		PCYU
N. longirostris	F	III	Caldera	-27.06306	-70.81092	13	17.x	30.xi.2014	J. Postlethwaite		PCYU
N. longirostris	F	III	Caldera	-27.06306	-70.81092	13	17.x	30.xi.2014	J. Postlethwaite		PCYU
N. longirostris	F	III	Caldera	-27.06306	-70.81092	13	17.x	30.xi.2014	J. Postlethwaite		PCYU
N. longirostris	F	III	Caldera	-27.06306	-70.81092	13	17.x	30.xi.2014	J. Postlethwaite		PCYU
N. longirostris	M	III	Caldera	-27.06306	-70.81092		12.xi.1997		L. Packer		PCYU
N. longirostris	M	III	Caldera (north)	-27.05709	-70.80511	16	17.x	30.xi.2014	J. Postlethwaite		PCYU
N. longirostris	M	III	Caldera (north)	-27.05709	-70.80511	16	17.x	30.xi.2014	J. Postlethwaite		PCYU
N. longirostris	M	III	Caldera (north)	-27.05709	-70.80511	16	17.x	30.xi.2014	J. Postlethwaite		PCYU
N. longirostris	M	III	Caldera (north)	-27.05709	-70.80511	16	17.x	30.xi.2014	J. Postlethwaite		PCYU
N. longirostris	M	III	Caldera (north)	-27.05709	-70.80511	16	17.x	30.xi.2014	J. Postlethwaite		PCYU
N. longirostris	M	III	Caldera (north)	-27.05709	-70.80511	16	17.x	30.xi.2014	J. Postlethwaite		PCYU
N. longirostris	M	III	Caldera (north)	-27.05709	-70.80511	16	17.x	30.xi.2014	J. Postlethwaite		PCYU
N. longirostris	M	III	Caldera (north)	-27.05709	-70.80511	16	17.x	30.xi.2014	J. Postlethwaite		PCYU
N. longirostris	F	III	Caldera (north)	-27.05709	-70.80511	16	17.x	30.xi.2014	J. Postlethwaite		PCYU
N. longirostris	F	III	Caldera (north)	-27.05709	-70.80511	16	17.x	30.xi.2014	J. Postlethwaite		PCYU
N. longirostris	M	III	Caldera (north)	-27.05709	-70.80511	16	17.x	30.xi.2014	J. Postlethwaite		PCYU
N. longirostris	F	III	Caldera (north)	-27.05709	-70.80511	16	17.x	30.xi.2014	J. Postlethwaite		PCYU
N. longirostris	M	III	Caldera (north)	-27.05709	-70.80511	16	17.x	30.xi.2014	J. Postlethwaite		PCYU
N. longirostris	F	III	Pesquera Bahía Caldera	-27.05413	-70.80428	0	22.x	6.xi.2013	J. Postlethwaite & S. Monckton		PCYU
N. longirostris	M	III	Pesquera Bahía Caldera	-27.05413	-70.80428	0	22.x	6.xi.2013	J. Postlethwaite & S. Monckton		PCYU
N. longirostris	F	III	Pesquera Bahía Caldera	-27.05413	-70.80428	0	15.xi.2012		J. Postlethwaite & S. Monckton		PCYU
N. longirostris	F	III	Pesquera Bahía Caldera	-27.05413	-70.80428	0	15.xi.2012		J. Postlethwaite & S. Monckton		PCYU
N. longirostris	F	III	Pesquera Bahía Caldera	-27.05413	-70.80428	0	15.xi.2012		J. Postlethwaite & S. Monckton		PCYU
N. longirostris	M	III	Pesquera Bahía Caldera	-27.05413	-70.80428	0	15.xi.2012		J. Postlethwaite & S. Monckton		PCYU
N. longirostris	M	III	Pesquera Bahia Cladera	-27.05413	-70.80428	0	22.x.2013		S. Monckton	CCDB-22789 F10	PCYU
N. longirostris	M	III	Pesquera Bahia Cladera	-27.05413	-70.80428	0	22.x.2013		S. Monckton	CCDB-22789 F09	PCYU
N. longirostris	M	III	Pesquera Bahia Cladera	-27.05413	-70.80428	0	22.x.2013		S. Monckton	CCDB-22789 F11	PCYU
N. longirostris	F	III	Panamericana km 1005, Chañaral	-26.35000	-70.63000		24.x.2000		L. Packer	CDN-06715-87	PCYU
N. longirostris	F	III	E of Chañaral, Pan Am km 1012-17	-26.33000	-70.44000		10.x.2001		Packer & Fraser		PCYU
N. profuga	F	II	SE of Taltal, Ruta 1, km 1	-25.55457	-70.35974	800	20.x	30.x.2014	J. Postlethwaite	CCDB-22013 F06	PCYU
N. profuga	M	II	SE of Taltal	-25.51670	-70.41994	625	15.x.2010		L Packer & E Almeida		PCYU
N. profuga	F	II	SE of Taltal	-25.51670	-70.41994	625	15.x.2010		L Packer & E Almeida		PCYU
N. profuga	F	II	Quebrada Taltal	-25.48838	-70.42362	498	17.x.2010		Packer & Fraser		PCYU
N. profuga	F	II	Quebrada Taltal	-25.48838	-70.42362	498	17.v.2010		L Packer & E Almeida		PCYU
N. profuga	F	II	N. of Taltal, Ruta 1, km 34.5	-25.32209	-70.44832	24	21.x	2.xii.2014	J. Postlethwaite, L. Packer		PCYU
N. profuga	F	II	N. of Taltal, Ruta 1, km 34.5	-25.32209	-70.44832	24	21.x	2.xii.2014	J. Postlethwaite, L. Packer	CCDB-22013 F02	PCYU
N. profuga	M	II	N of Taltal	-25.32000	-70.44000		20.xi.2002		J. Grixti & A Zayed		PCYU
N. profuga	M	II	N. of Taltal, Ruta 1 km 43.6	-25.24630	-70.43214	29	30.x	2.xii..2014	J. Postlethwaite, L. Packer	CCDB-28230 C06	PCYU
N. profuga	F	III	SE of Los Choros	-29.30518	-71.28362	280	13.ix.2010		L. Packer		PCYU
N. profuga	M	III	Hwy 5, Cachiyuyo	-29.10726	-70.92138	1247	9.x.2010		Packer & Fraser		PCYU
N. profuga	F	III	S of Chollay	-29.06342	-70.13074	1780	7.xi.	12.xii.2013	J. Postlethwaite & S. Monckton		PCYU
N. profuga	F	III	S of Chollay	-29.06342	-70.13074	1780	7.xi.	12.xii.2013	J. Postlethwaite & S. Monckton		PCYU
N. profuga	F	III	S of Chollay	-29.06342	-70.13074	1780	7.xi.	12.xii.2013	J. Postlethwaite & S. Monckton		PCYU

N. profuga	F	III	S of Chollay	-29.06342	-70.13074	1780	7.xi.	12.xii.2013	J. Postlethwaite & S. Monckton	PCYU
N. profuga	F	III	S of Chollay	-29.06342	-70.13074	1780	7.xi.	12.xii.2013	J. Postlethwaite & S. Monckton	PCYU
N. profuga	F	III	S of Chollay	-29.06342	-70.13074	1780	7.xi.	12.xii.2013	J. Postlethwaite & S. Monckton	PCYU
N. profuga	F	III	S of Chollay	-29.06342	-70.13074	1780	7.xi.	12.xii.2013	J. Postlethwaite & S. Monckton	PCYU
N. profuga	F	III	S of Chollay	-29.06342	-70.13074	1780	7.xi.	12.xii.2013	J. Postlethwaite & S. Monckton	PCYU
N. profuga	M	III	S of Chollay	-29.06342	-70.13074	1780	15.x	07.xi.2013	J. Postlethwaite & S. Monckton	PCYU
N. profuga	F	III	S of Chollay	-29.06342	-70.13074	1780	7.xi.	12.xii.2013	J. Postlethwaite & S. Monckton	PCYU
N. profuga	F	III	S of Chollay	-29.06342	-70.13074	1780	7.xi.	12.xii.2013	J. Postlethwaite & S. Monckton	PCYU
N. profuga	F	III	S of Chollay	-29.06342	-70.13074	1780	7.xi.	12.xii.2013	J. Postlethwaite & S. Monckton	PCYU
N. profuga	F	III	S of Chollay	-29.06342	-70.13074	1780	7.xi.	12.xii.2013	J. Postlethwaite & S. Monckton	PCYU
N. profuga	F	III	S of Chollay	-29.06342	-70.13074	1780	7.xi.	12.xii.2013	J. Postlethwaite & S. Monckton	PCYU
N. profuga	F	III	S of Chollay	-29.06342	-70.13074	1780	15.x	7.xi.2013	J. Postlethwaite & S. Monckton	PCYU
N. profuga	F	III	S of Chollay	-29.06342	-70.13074	1780	15.x	7.xi.2013	J. Postlethwaite & S. Monckton	PCYU
N. profuga	F	III	S of Chollay	-29.06342	-70.13074	1780	7.xi.	12.xii.2013	J. Postlethwaite & S. Monckton	PCYU
N. profuga	M	III	S of Chollay	-29.06342	-70.13074	1780	7.xi.	12.xii.2013	J. Postlethwaite & S. Monckton	PCYU
N. profuga	F	III	S of Chollay	-29.06342	-70.13074	1780	7.xi.	12.xii.2013	J. Postlethwaite & S. Monckton	PCYU
N. profuga	M	III	S of Chollay	-29.06342	-70.13074	1780	7.xi.	12.xii.2013	J. Postlethwaite & S. Monckton	PCYU
N. profuga	M	III	S of Chollay	-29.06342	-70.13074	1780	7.xi.	12.xii.2013	J. Postlethwaite & S. Monckton	PCYU
N. profuga	F	III	S of Chollay	-29.06342	-70.13074	1780	7.xi.	12.xii.2013	J. Postlethwaite & S. Monckton	PCYU
N. profuga	M	III	S of Chollay	-29.06342	-70.13074	1780	7.xi.	12.xii.2013	J. Postlethwaite & S. Monckton	PCYU
N. profuga	F	III	S of Chollay	-29.06342	-70.13074	1780	7.xi.	12.xii.2013	J. Postlethwaite & S. Monckton	PCYU
N. profuga	M	III	S of Chollay	-29.06342	-70.13074	1780	15.x	7.xi.2013	J. Postlethwaite & S. Monckton	PCYU
N. profuga	F	III	S of Chollay	-29.06342	-70.13074	1780	15.x	7.xi.2013	J. Postlethwaite & S. Monckton	PCYU
N. profuga	M	III	S of Chollay	-29.06342	-70.13074	1780	15.x	7.xi.2013	J. Postlethwaite & S. Monckton	PCYU
N. profuga	F	III	S of Chollay	-29.06342	-70.13074	1780	15.x	7.xi.2013	J. Postlethwaite & S. Monckton	PCYU
N. profuga	F	III	S of Chollay	-29.06342	-70.13074	1780	15.x	7.xi.2013	J. Postlethwaite & S. Monckton	PCYU
N. profuga	F	III	S of Chollay	-29.05954	-70.13278	1782	7.xi.	12.xii.2013	J. Postlethwaite & S. Monckton	PCYU
N. profuga	F	III	S of Chollay	-29.05954	-70.13278	1782	7.xi.	12.xii.2013	J. Postlethwaite & S. Monckton	PCYU
N. profuga	F	III	S of Chollay	-29.05954	-70.13278	1782	7.xi.	12.xii.2013	J. Postlethwaite & S. Monckton	PCYU
N. profuga	M	III	S of Chollay	-29.05954	-70.13278	1782	7.xi.	12.xii.2013	J. Postlethwaite & S. Monckton	PCYU
N. profuga	F	III	S of Chollay	-29.05954	-70.13278	1782	7.xi.	12.xii.2013	J. Postlethwaite & S. Monckton	PCYU
N. profuga	F	III	S of Chollay	-29.05954	-70.13278	1782	7.xi.	12.xii.2013	J. Postlethwaite & S. Monckton	PCYU
N. profuga	F	III	S of Chollay	-29.05954	-70.13278	1782	7.xi.	12.xii.2013	J. Postlethwaite & S. Monckton	PCYU
N. profuga	F	III	15km W. of Domeyko	-28.96813	-71.02254	602	15.x	30.xi.2014	J. Postlethwaite	PCYU
N. profuga	F	III	15km W. of Domeyko	-28.96813	-71.02254	602	15.x	30.xi.2014	J. Postlethwaite	PCYU
N. profuga	F	III	15km W. of Domeyko	-28.96681	-71.03648	587	15.x	30.xi.2014	J. Postlethwaite	PCYU
N. profuga	F	III	2 km W. of Domeyko	-28.96536	-70.91647	759	15.x	30.xi.2014	J. Postlethwaite	PCYU
N. profuga	F	III	3 km W. of Domeyko	-28.96536	-70.91647	759	15.x	30.xi.2014	J. Postlethwaite	PCYU
N. profuga	F	III	4 km W. of Domeyko	-28.96536	-70.91647	759	15.x	30.xi.2014	J. Postlethwaite	PCYU
N. profuga	F	III	5 km W. of Domeyko	-28.96536	-70.91647	759	15.x	30.xi.2014	J. Postlethwaite	PCYU
N. profuga	F	III	6 km W. of Domeyko	-28.96536	-70.91647	759	15.x	30.xi.2014	J. Postlethwaite	PCYU
N. profuga	M	III	7 km W. of Domeyko	-28.96536	-70.91647	759	15.x	30.xi.2014	J. Postlethwaite	PCYU
N. profuga	M	III	Rd. to Juntas de Valeriano, km 60.5	-28.93413	-70.08402	1644	15.x	7.xi.2013	J. Postlethwaite & S. Monckton	PCYU
N. profuga	M	III	Rd. to Juntas de Valeriano, km 60.5	-28.93413	-70.08402	1644	15.x	7.xi.2013	J. Postlethwaite & S. Monckton	PCYU
N. profuga	F	III	Rd. to Juntas de Valeriano, km 60.5	-28.93413	-70.08402	1644	7.xi.	12.xii.2013	J. Postlethwaite & S. Monckton	PCYU
N. profuga	F	III	Rd. to Juntas de Valeriano, km 60.5	-28.93413	-70.08402	1644	7.xi.	12.xii.2013	J. Postlethwaite & S. Monckton	PCYU
N. profuga	F	III	Rd. to Juntas de Valeriano, km 60.5	-28.93413	-70.08402	1644	7.xi.	12.xii.2013	J. Postlethwaite & S. Monckton	PCYU
N. profuga	M	III	Juntas de Valeriano, km 67	-28.89156	-70.04668	1849	15.x	7.xi.2013	J. Postlethwaite & S. Monckton	PCYU
N. profuga	M	III	Rd. to Juntas de Valeriano, km 25	-28.85546	-70.29300	1095	15.x.2013		S. Monckton	PCYU

N. profuga	M	III	Chuingo	-28.82510	-70.35596	963	15.ix.2010		L. Packer		PCYU
N. profuga	M	III	E of Vallenar	-28.77163	-70.44857	830	1.x.2013		L. Packer		PCYU
N. profuga	F	III	E of Vallenar	-28.77163	-70.44857	830	1.x.2013		L. Packer		PCYU
N. profuga	M	III	E of Vallenar	-28.77163	-70.44857	830	1.x.2014		L. Packer		PCYU
N. profuga	M	III	E of Vallenar	-28.77163	-70.44857	830	1.x.2013		L. Packer		PCYU
N. profuga	F	III	E of Vallenar	-28.77163	-70.44857	830	1.x.2013		L. Packer		PCYU
N. profuga	M	III	E of Vallenar	-28.77163	-70.44857	830	1.x.2013		L. Packer		PCYU
N. profuga	M	III	10 km N of Vallenar	-28.46000	-70.73000		18.x.2000		L. Packer		PCYU
N. profuga	F	III	2.5 km N of Huasco Bajo	-28.45540	-71.18480		19.x.2009		J. Gibbs		PCYU
N. profuga	F	III	Rd. to La Semilla, C-493, km 10.5	-28.24885	-69.74296	2306	6.xi	10.xii.2013	J. Postlethwaite & S. Monckton		PCYU
N. profuga	M	III	Rd. to La Semilla, C-493, km 10.5	-28.24885	-69.74296	2306	6.xi	10.xii.2013	J. Postlethwaite & S. Monckton		PCYU
N. profuga	F	III	Rd. to La Semilla, C-493, km 10.5	-28.24885	-69.74296	2306	6.xi	10.xii.2013	J. Postlethwaite & S. Monckton		PCYU
N. profuga	M	III	Rd. to La Semilla, C-493, km 10.5	-28.24885	-69.74296	2306	6.xi	10.xii.2013	J. Postlethwaite & S. Monckton		PCYU
N. profuga	M	III	Rd. to La Semilla, C-493, km 10.5	-28.24885	-69.74296	2306	6.xi	10.xii.2013	J. Postlethwaite & S. Monckton		PCYU
N. profuga	F	III	Rd. to La Semilla, C-493, km 10.5	-28.24885	-69.74296	2306	6.xi	10.xii.2013	J. Postlethwaite & S. Monckton		PCYU
N. profuga	M	III	Rd. to La Semilla, C-493, km 10.5	-28.24885	-69.74296	2306	6.xi	10.xii.2013	J. Postlethwaite & S. Monckton		PCYU
N. profuga	F	III	Rd. to La Semilla, C-493, km 10.5	-28.24885	-69.74296	2306	6.xi	10.xii.2013	J. Postlethwaite & S. Monckton		PCYU
N. profuga	M	III	Rd. to La Semilla, C-493, km 10.5	-28.24885	-69.74296	2306	6.xi	10.xii.2013	J. Postlethwaite & S. Monckton		PCYU
N. profuga	F	III	Rd. to La Semilla, C-493, km 7	-28.22434	-69.76015	2125	6.xi	10.xii.2013	J. Postlethwaite & S. Monckton		PCYU
N. profuga	M	III	Rd. to La Semilla, C-493, km 7	-28.22434	-69.76015	2125	20.x	6.xi.2013	J. Postlethwaite & S. Monckton		PCYU
N. profuga	F	III	Rd. to La Semilla, C-493, km 7	-28.22434	-69.76015	2125	6.xi	10.xii.2013	J. Postlethwaite & S. Monckton		PCYU
N. profuga	M	III	Rd. to La Semilla, C-493, km 7	-28.22434	-69.76015	2125	6.xi	11.xii.2013	J. Postlethwaite & S. Monckton		PCYU
N. profuga	F	III	Rd. to La Semilla, C-493, km 7	-28.22434	-69.76015	2125	20.x	6.xi.2013	J. Postlethwaite & S. Monckton		PCYU
N. profuga	M	III	Rd. to La Semilla, C-493, km 7	-28.22434	-69.76015	2125	20.x	6.xi.2013	J. Postlethwaite & S. Monckton		PCYU
N. profuga	F	III	SE of Copiapo	-28.18238	-69.83110	1704	6.xi	10.xii.2013	J. Postlethwaite & S. Monckton		PCYU
N. profuga	F	III	SE of Copiapo	-28.18238	-69.83110	1704	6.xi	10.xii.2013	J. Postlethwaite & S. Monckton		PCYU
N. profuga	F	III	Rd. to Mina Caserones, km 1	-28.17552	-69.80375	1829	21.x	6.xi.2013	J. Postlethwaite & S. Monckton		PCYU
N. profuga	F	III	Rd. to Mina Caserones, km 1	-28.17552	-69.80375	1829	21.x	6.xi.2013	J. Postlethwaite & S. Monckton		PCYU
N. profuga	M	III	Rd. to Pircas Negras, km 1.3	-28.17304	-69.80193	1850	1.xi.2014		J. Postlethwaite	CCDB-22013 F08	PCYU
N. profuga	F	III	Rd. to Pastos Largos, km 4	-28.16429	-69.79134	2102	6.xi	11.xii.2013	J. Postlethwaite & S. Monckton		PCYU
N. profuga	F	III	Rd. to Pastos Largos, km 4	-28.16429	-69.79134	2102	6.xi	11.xii.2013	J. Postlethwaite & S. Monckton		PCYU
N. profuga	F	III	Rd. to Pastos Largos, km 4	-28.16429	-69.79134	2102	6.xi	11.xii.2013	J. Postlethwaite & S. Monckton		PCYU
N. profuga	M	III	Posada Elsa, N of Vallenar	-28.15000	-70.63000		11.x.2000		L. Packer		PCYU
N. profuga	M	III	Rd. to Pircas Negras, km 8	-28.12614	-69.76213	2086	20.x	6.xi.2013	J. Postlethwaite & S. Monckton		PCYU
N. profuga	F	III	Rd. to Pircas Negras, km 8	-28.12614	-69.76213	2086	20.x	6.xi.2013	J. Postlethwaite & S. Monckton		PCYU
N. profuga	F	III	Rd. to Pircas Negras, km 8	-28.12614	-69.76213	2086	20.x	6.xi.2013	J. Postlethwaite & S. Monckton		PCYU
N. profuga	F	III	Rd. to Pircas Negras, km 8	-28.12614	-69.76213	2086	20.x	6.xi.2013	J. Postlethwaite & S. Monckton		PCYU
N. profuga	M	III	Rd. to Pircas Negras, km 8	-28.12614	-69.76213	2086	20.x	6.xi.2013	J. Postlethwaite & S. Monckton		PCYU
N. profuga	M	III	Rd. to Pircas Negras, km 8	-28.12614	-69.76213	2086	20.x	6.xi.2013	J. Postlethwaite & S. Monckton		PCYU
N. profuga	M	III	Rd. to Pircas Negras, km 8	-28.12614	-69.76213	2086	20.x	6.xi.2013	J. Postlethwaite & S. Monckton		PCYU
N. profuga	M	III	Rd. to Pircas Negras, km 8	-28.12614	-69.76213	2086	20.x	6.xi.2013	J. Postlethwaite & S. Monckton		PCYU
N. profuga	M	III	Rd. to Pircas Negras, km 8	-28.12614	-69.76213	2086	20.x	6.xi.2013	J. Postlethwaite & S. Monckton		PCYU
N. profuga	M	III	Rd. to Pircas Negras, km 8	-28.12614	-69.76213	2086	20.x	6.xi.2013	J. Postlethwaite & S. Monckton		PCYU
N. profuga	M	III	Rd. to Pircas Negras, km 8	-28.12614	-69.76213	2086	20.x	6.xi.2013	J. Postlethwaite & S. Monckton		PCYU
N. profuga	M	III	Rd. to Pircas Negras, km 8	-28.12614	-69.76213	2086	20.x	6.xi.2013	J. Postlethwaite & S. Monckton		PCYU
N. profuga	M	III	Rd. to Pircas Negras, km 8	-28.12614	-69.76213	2086	20.x	6.xi.2013	J. Postlethwaite & S. Monckton		PCYU
N. profuga	F	III	Rd. to Pircas Negras, km 8	-28.12614	-69.76213	2086	20.x	6.xi.2013	J. Postlethwaite & S. Monckton		PCYU
N. profuga	M	III	Rd. to Pircas Negras, km 8	-28.12614	-69.76213	2086	20.x	6.xi.2013	J. Postlethwaite & S. Monckton		PCYU
N. profuga	M	III	Rd. to Pircas Negras, km 8	-28.12614	-69.76213	2086	20.x	6.xi.2013	J. Postlethwaite & S. Monckton		PCYU

N. profuga	M	III	Rd. to Pircas Negras, km 8	-28.12614	-69.76213	2086	20.x	6.xi.2013	J. Postlethwaite & S. Monckton		PCYU
N. profuga	M	III	Rd. to Pircas Negras, km 8	-28.12614	-69.76213	2086	20.x	6.xi.2013	J. Postlethwaite & S. Monckton		PCYU
N. profuga	M	III	Rd. to Pircas Negras, km 8	-28.12614	-69.76213	2086	20.x	6.xi.2013	J. Postlethwaite & S. Monckton		PCYU
N. profuga	M	III	Rd. to Pircas Negras, km 8	-28.12614	-69.76213	2086	20.x	6.xi.2013	J. Postlethwaite & S. Monckton		PCYU
N. profuga	M	III	Rd. to Pircas Negras, km 8	-28.12614	-69.76213	2086	6.xi	11.xii.2013	J. Postlethwaite & S. Monckton		PCYU
N. profuga	F	III	Rd. to Pircas Negras, km 8	-28.12614	-69.76213	2086	20.x	6.xi.2013	J. Postlethwaite & S. Monckton		PCYU
N. profuga	M	III	Rd. to Pircas Negras, km 8	-28.12614	-69.76213	2086	6.xi	11.xii.2013	J. Postlethwaite & S. Monckton		PCYU
N. profuga	M	III	Rd. to Pircas Negras, km 8	-28.12614	-69.76213	2086	20.x	6.xi.2013	J. Postlethwaite & S. Monckton		PCYU
N. profuga	M	III	Rd. to Pircas Negras, km 8	-28.12614	-69.76213	2086	20.x	6.xi.2013	J. Postlethwaite & S. Monckton		PCYU
N. profuga	M	III	Rd. to Pircas Negras, km 8	-28.12614	-69.76213	2086	20.x	6.xi.2013	J. Postlethwaite & S. Monckton		PCYU
N. profuga	F	III	Rd. to Pircas Negras, km 8	-28.12614	-69.76213	2086	6.xi	11.xii.2013	J. Postlethwaite & S. Monckton		PCYU
N. profuga	F	III	Rd. to Pircas Negras, km 8	-28.12614	-69.76213	2086	20.x	6.xi.2013	J. Postlethwaite & S. Monckton		PCYU
N. profuga	F	III	Rd. to Pircas Negras, km 8	-28.12614	-69.76213	2086	20.x	6.xi.2013	J. Postlethwaite & S. Monckton		PCYU
N. profuga	M	III	Rd. to Pircas Negras, km 8	-28.12614	-69.76213	2086	20.x	6.xi.2013	J. Postlethwaite & S. Monckton		PCYU
N. profuga	M	III	Rd. to Pircas Negras, km 8	-28.12614	-69.76213	2086	20.x	6.xi.2013	J. Postlethwaite & S. Monckton		PCYU
N. profuga	F	III	Rd. to Pircas Negras, km 8	-28.12614	-69.76213	2086	20.x	6.xi.2013	J. Postlethwaite & S. Monckton		PCYU
N. profuga	F	III	Rd. to Pircas Negras, km 8	-28.12614	-69.76213	2086	6.xi	11.xii.2013	J. Postlethwaite & S. Monckton		PCYU
N. profuga	M	III	SE of Copiapo	-28.11427	-69.92848	1324	30.ix	20.x.2013	J. Postlethwaite & S. Monckton		PCYU
N. profuga	F	III	Rd. to Pircas Negras, km 16.5	-28.06649	-69.73631	2277	20x	12.xii.2013	J. Postlethwaite & S. Monckton		PCYU
N. profuga	M	III	Rd. to Pircas Negras, km 16.5	-28.06649	-69.73631	2277	20.x	12.xii.2013	J. Postlethwaite & S. Monckton		PCYU
N. profuga	M	III	Rd. to Pircas Negras, km 16.5	-28.06649	-69.73631	2277	11.xii.2014		J. Postlethwaite		PCYU
N. profuga	M	III	13.5km W Los Sapos	-28.01883	-70.55381	488	8.v.2010		Packer & Fraser	B10006 F11	PCYU
N. profuga	F	III	13.5 km W of Los Sapos	-28.01883	-70.55381	488	8.x.2010		Packer & Fraser		PCYU
N. profuga	M	III	Hwy 5, S of Copiapo	-28.01883	-70.55381	488	22.x	25.x2010	L. Packer		PCYU
N. profuga	M	III	13.5km W Los Sapos	-28.01883	-70.55381	488	22.x	25.x.2010	L. Packer		PCYU
N. profuga	F	III	13.5km W Los Sapos	-28.01883	-70.55381	488	22.x	25.x.2010	L. Packer		PCYU
N. profuga	F	III	13.5km W Los Sapos	-28.01883	-70.55381	488	22.x	25.x.2010	L. Packer		PCYU
N. profuga	F	III	13.5km W Los Sapos	-28.01883	-70.55381	488	22.x	25.x.2010	L. Packer		PCYU
N. profuga	F	III	13.5km W Los Sapos	-28.01883	-70.55381	488	22.x	25.x.2010	L. Packer		PCYU
N. profuga	F	III	13.5km W Los Sapos	-28.01883	-70.55381	488	22.x	25.x.2010	L. Packer		PCYU
N. profuga	F	III	13.5km W Los Sapos	-28.01883	-70.55381	488	22.x	25.x.2010	L. Packer		PCYU
N. profuga	F	III	13.5km W Los Sapos	-28.01883	-70.55381	488	22.x	25.x.2010	L. Packer		PCYU
N. profuga	F	III	13.5km W Los Sapos	-28.01883	-70.55381	488	22.x	25.x.2010	L. Packer		PCYU
N. profuga	F	III	13.5km W Los Sapos	-28.01883	-70.55381	488	22.x	25.x.2010	L. Packer		PCYU
N. profuga	F	III	13.5km W Los Sapos	-28.01883	-70.55381	488	22.x	25.x.2010	L. Packer		PCYU
N. profuga	F	III	13.5km W Los Sapos	-28.01883	-70.55381	488	22.x	25.x.2010	L. Packer		PCYU
N. profuga	F	III	13.5km W Los Sapos	-28.01883	-70.55381	488	22.x	25.x.2010	L. Packer		PCYU
N. profuga	F	III	13.5km W Los Sapos	-28.01883	-70.55381	488	22.x	25.x.2010	L. Packer		PCYU
N. profuga	F	III	13.5km W Los Sapos	-28.01883	-70.55381	488	22.x	25.x.2010	L. Packer		PCYU
N. profuga	F	III	13.5km W Los Sapos	-28.01883	-70.55381	488	22.x	25.x.2010	L. Packer		PCYU
N. profuga	M	III	13.5km W Los Sapos	-28.01883	-70.55381	488	22.x	25.x.2010	L. Packer		PCYU
N. profuga	M	III	13.5km W Los Sapos	-28.01883	-70.55381	488	22.x	25.x.2010	L. Packer		PCYU
N. profuga	M	III	13.5km W Los Sapos	-28.01883	-70.55381	488	22.x	25.x.2010	L. Packer		PCYU
N. profuga	M	III	13.5km W Los Sapos	-28.01883	-70.55381	488	22.x	25.x.2010	L. Packer		PCYU
N. profuga	M	III	Hwy 5, N of Vallenar	-28.01883	-70.55381	488	22.x	25.x.2010	L. Packer		PCYU
N. profuga	M	III	Hwy 5, N of Vallenar	-28.01883	-70.55381	488	22.x	25.x.2010	L. Packer		PCYU
N. profuga	M	III	Hwy 5, N of Vallenar	-28.01883	-70.55381	488	22.x	25.x.2010	L. Packer		PCYU
N. profuga	M	III	Hwy 5, N of Vallenar	-28.01883	-70.55381	488	22.x	25.x.2010	L. Packer		PCYU
N. profuga	M	III	Hwy 5, N of Vallenar	-28.01883	-70.55381	488	22.x	25.x.2010	L. Packer		PCYU

N. profuga	M	III	Hwy 5, N of Vallenar	-28.01883	-70.55381	488	22.x	25.x.2010	L. Packer		PCYU
N. profuga	M	III	Hwy 5, N of Vallenar	-28.01883	-70.55381	488	22.x	25.x.2010	L. Packer		PCYU
N. profuga	M	III	Hwy 5, N of Vallenar	-28.01883	-70.55381	488	22.x	25.x.2010	L. Packer		PCYU
N. profuga	M	III	Hwy 5, N of Vallenar	-28.01883	-70.55381	488	22.x	25.x.2010	L. Packer		PCYU
N. profuga	M	III	Hwy 5, N of Vallenar	-28.01883	-70.55381	488	22.x	25.x.2010	L. Packer		PCYU
N. profuga	M	III	Hwy 5, N of Vallenar	-28.01883	-70.55381	488	22.x	25.x.2010	L. Packer		PCYU
N. profuga	M	III	Hwy 5, N of Vallenar	-28.01883	-70.55381	488	22.x	25.x.2010	L. Packer		PCYU
N. profuga	M	III	Hwy 5, N of Vallenar	-28.01883	-70.55381	488	22.x	25.x.2010	L. Packer		PCYU
N. profuga	M	III	Hwy 5, N of Vallenar	-28.01883	-70.55381	488	22.x	25.x.2010	L. Packer		PCYU
N. profuga	M	III	Hwy 5, N of Vallenar	-28.01883	-70.55381	488	22.x	25.x.2010	L. Packer		PCYU
N. profuga	M	III	Hwy 5, N of Vallenar	-28.01883	-70.55381	488	22.x	25.x.2010	L. Packer		PCYU
N. profuga	M	III	Hwy 5, N of Vallenar	-28.01883	-70.55381	488	22.x	25.x.2010	L. Packer		PCYU
N. profuga	M	III	Hwy 5, N of Vallenar	-28.01883	-70.55381	488	22.x	25.x.2010	L. Packer		PCYU
N. profuga	F	III	Hwy 5, N of Vallenar	-28.01883	-70.55381	488	22.x	25.x.2010	L. Packer		PCYU
N. profuga	F	III	Hwy 5, N of Vallenar	-28.01883	-70.55381	488	22.x	25.x.2010	L. Packer		PCYU
N. profuga	F	III	Hwy 5, N of Vallenar	-28.01883	-70.55381	488	22.x	25.x.2010	L. Packer		PCYU
N. profuga	F	III	Hwy 5, N of Vallenar	-28.01883	-70.55381	488	22.x	25.x.2010	L. Packer		PCYU
N. profuga	F	III	Hwy 5, N of Vallenar	-28.01883	-70.55381	488	22.x	25.x.2010	L. Packer		PCYU
N. profuga	F	III	Hwy 5, N of Vallenar	-28.01883	-70.55381	488	22.x	25.x.2010	L. Packer		PCYU
N. profuga	F	III	Hwy 5, N of Vallenar	-28.01883	-70.55381	488	22.x	25.x.2010	L. Packer		PCYU
N. profuga	F	III	Hwy 5, N of Vallenar	-28.01883	-70.55381	488	22.x	25.x.2010	L. Packer		PCYU
N. profuga	F	III	Hwy 5, N of Vallenar	-28.01883	-70.55381	488	22.x	25.x.2010	L. Packer		PCYU
N. profuga	F	III	Hwy 5, N of Vallenar	-28.01883	-70.55381	488	22.x	25.x.2010	L. Packer		PCYU
N. profuga	F	III	Hwy 5, N of Vallenar	-28.01883	-70.55381	488	22.x	25.x.2010	L. Packer		PCYU
N. profuga	F	III	Hwy 5, N of Vallenar	-28.01883	-70.55381	488	22.x	25.x.2010	L. Packer		PCYU
N. profuga	F	III	Hwy 5, N of Vallenar	-28.01883	-70.55381	488	22.x	25.x.2010	L. Packer		PCYU
N. profuga	F	III	Hwy 5, N of Vallenar	-28.01883	-70.55381	488	22.x	25.x.2010	L. Packer		PCYU
N. profuga	F	III	Hwy 5, N of Vallenar	-28.01883	-70.55381	488	22.x	25.x.2010	L. Packer		PCYU
N. profuga	F	III	Hwy 5, N of Vallenar	-28.01883	-70.55381	488	22.x	25.x.2010	L. Packer		PCYU
N. profuga	F	III	Hwy 5, N of Vallenar	-28.01883	-70.55381	488	22.x	25.x.2010	L. Packer		PCYU
N. profuga	F	III	Hwy 5, N of Vallenar	-28.01883	-70.55381	488	22.x	25.x.2010	L. Packer		PCYU
N. profuga	F	III	Hwy 5, N of Vallenar	-28.01883	-70.55381	488	22.x	25.x.2010	L. Packer		PCYU
N. profuga	F	III	Hwy 5, N of Vallenar	-28.01883	-70.55381	488	22.x	25.x.2010	L. Packer		PCYU
N. profuga	F	III	Hwy 5, N of Vallenar	-28.01883	-70.55381	488	22.x	25.x.2010	L. Packer		PCYU
N. profuga	F	III	Hwy 5, N of Vallenar	-28.01883	-70.55381	488	22.x	25.x.2010	L. Packer		PCYU
N. profuga	F	III	Hwy 5, N of Vallenar	-28.01883	-70.55381	488	22.x	25.x.2010	L. Packer		PCYU
N. profuga	F	III	Hwy 5, N of Vallenar	-28.01883	-70.55381	488	22.x	25.x.2010	L. Packer		PCYU
N. profuga	F	III	Hwy 5, N of Vallenar	-28.01883	-70.55381	488	22.x	25.x.2010	L. Packer		PCYU
N. profuga	F	III	Hwy 5, N of Vallenar	-28.01883	-70.55381	488	22.x	25.x.2010	L. Packer		PCYU
N. profuga	F	III	Hwy 5, N of Vallenar	-28.01883	-70.55381	488	22.x	25.x.2010	L. Packer		PCYU
N. profuga	F	III	Hwy 5, N of Vallenar	-28.01883	-70.55381	488	22.x	25.x.2010	L. Packer		PCYU
N. profuga	F	III	Hwy 5, N of Vallenar	-28.01883	-70.55381	488	22.x	25.x.2010	L. Packer		PCYU
N. profuga	F	III	Hwy 5, N of Vallenar	-28.01883	-70.55381	488	22.x	25.x.2010	L. Packer		PCYU
N. profuga	F	III	Hwy 5, N of Vallenar	-28.01883	-70.55381	488	22.x	25.x.2010	L. Packer		PCYU
N. profuga	F	III	Hwy 5, N of Vallenar	-28.01883	-70.55381	488	22.x	25.x.2010	L. Packer		PCYU
N. profuga	F	III	Hwy 5, N of Vallenar	-28.01883	-70.55381	488	22.x	25.x.2010	L. Packer		PCYU
N. profuga	F	III	Hwy 5, N of Vallenar	-28.01883	-70.55381	488	22.x	25.x.2010	L. Packer		PCYU
N. profuga	F	III	Hwy 5, N of Vallenar	-28.01883	-70.55381	488	22.x	25.x.2010	L. Packer		PCYU
N. profuga	F	III	Hwy 5, N of Vallenar	-28.01883	-70.55381	488	22.x	25.x.2010	L. Packer		PCYU

N. profuga	F	III	Hwy 5, N of Vallenar	-28.01883	-70.55381	488	22.x	25.x.2010	L. Packer	PCYU
N. profuga	F	III	Hwy 5, N of Vallenar	-28.01883	-70.55381	488	22.x	25.x.2010	L. Packer	PCYU
N. profuga	F	III	Hwy 5, N of Vallenar	-28.01883	-70.55381	488	22.x	25.x.2010	L. Packer	PCYU
N. profuga	F	III	Hwy 5, N of Vallenar	-28.01883	-70.55381	488	22.x	25.x.2010	L. Packer	PCYU
N. profuga	F	III	Hwy 5, N of Vallenar	-28.01883	-70.55381	488	22.x	25.x.2010	L. Packer	PCYU
N. profuga	F	III	Hwy 5, N of Vallenar	-28.01883	-70.55381	488	22.x	25.x.2010	L. Packer	PCYU
N. profuga	F	III	Hwy 5, N of Vallenar	-28.01883	-70.55381	488	22.x	25.x.2010	L. Packer	PCYU
N. profuga	F	III	Hwy 5, N of Vallenar	-28.01883	-70.55381	488	22.x	25.x.2010	L. Packer	PCYU
N. profuga	F	III	Hwy 5, N of Vallenar	-28.01883	-70.55381	488	22.x	25.x.2010	L. Packer	PCYU
N. profuga	F	III	Hwy 5, N of Vallenar	-28.01883	-70.55381	488	22.x	25.x.2010	L. Packer	PCYU
N. profuga	F	III	Hwy 5, N of Vallenar	-28.01883	-70.55381	488	22.x	25.x.2010	L. Packer	PCYU
N. profuga	F	III	Hwy 5, N of Vallenar	-28.01883	-70.55381	488	22.x	25.x.2010	L. Packer	PCYU
N. profuga	F	III	Hwy 5, N of Vallenar	-28.01883	-70.55381	488	22.x	25.x.2010	L. Packer	PCYU
N. profuga	F	III	Hwy 5, N of Vallenar	-28.01883	-70.55381	488	22.x	25.x.2010	L. Packer	PCYU
N. profuga	F	III	Hwy 5, N of Vallenar	-28.01883	-70.55381	488	22.x	25.x.2010	L. Packer	PCYU
N. profuga	F	III	Hwy 5, N of Vallenar	-28.01883	-70.55381	488	22.x	25.x.2010	L. Packer	PCYU
N. profuga	F	III	Hwy 5, N of Vallenar	-28.01883	-70.55381	488	22.x	25.x.2010	L. Packer	PCYU
N. profuga	F	III	Hwy 5, N of Vallenar	-28.01883	-70.55381	488	22.x	25.x.2010	L. Packer	PCYU
N. profuga	F	III	Hwy 5, N of Vallenar	-28.01883	-70.55381	488	22.x	25.x.2010	L. Packer	PCYU
N. profuga	F	III	Hwy 5, N of Vallenar	-28.01883	-70.55381	488	22.x	25.x.2010	L. Packer	PCYU
N. profuga	F	III	Hwy 5, N of Vallenar	-28.01883	-70.55381	488	22.x	25.x.2010	L. Packer	PCYU
N. profuga	F	III	Hwy 5, N of Vallenar	-28.01883	-70.55381	488	22.x	25.x.2010	L. Packer	PCYU
N. profuga	F	III	Hwy 5, N of Vallenar	-28.01883	-70.55381	488	22.x	25.x.2010	L. Packer	PCYU
N. profuga	F	III	Hwy 5, N of Vallenar	-28.01883	-70.55381	488	22.x	25.x.2010	L. Packer	PCYU
N. profuga	F	III	Hwy 5, N of Vallenar	-28.01883	-70.55381	488	22.x	25.x.2010	L. Packer	PCYU
N. profuga	F	III	Hwy 5, N of Vallenar	-28.01883	-70.55381	488	22.x	25.x.2010	L. Packer	PCYU
N. profuga	F	III	Hwy 5, N of Vallenar	-28.01883	-70.55381	488	22.x	25.x.2010	L. Packer	PCYU
N. profuga	F	III	Hwy 5, N of Vallenar	-28.01883	-70.55381	488	22.x	25.x.2010	L. Packer	PCYU
N. profuga	F	III	Hwy 5, N of Vallenar	-28.01883	-70.55381	488	22.x	25.x.2010	L. Packer	PCYU
N. profuga	F	III	Hwy 5, N of Vallenar	-28.01883	-70.55381	488	22.x	25.x.2010	L. Packer	PCYU
N. profuga	F	III	Hwy 5, N of Vallenar	-28.01883	-70.55381	488	22.x	25.x.2010	L. Packer	PCYU
N. profuga	F	III	Hwy 5, N of Vallenar	-28.01883	-70.55381	488	22.x	25.x.2010	L. Packer	PCYU
N. profuga	F	III	Hwy 5, N of Vallenar	-28.01883	-70.55381	488	22.x	25.x.2010	L. Packer	PCYU
N. profuga	F	III	Hwy 5, N of Vallenar	-28.01883	-70.55381	488	22.x	25.x.2010	L. Packer	PCYU
N. profuga	F	III	Hwy 5, N of Vallenar	-28.01883	-70.55381	488	22.x	25.x.2010	L. Packer	PCYU
N. profuga	F	III	Hwy 5, N of Vallenar	-28.01883	-70.55381	488	22.x	25.x.2010	L. Packer	PCYU
N. profuga	F	III	Hwy 5, N of Vallenar	-28.01883	-70.55381	488	22.x	25.x.2010	L. Packer	PCYU
N. profuga	F	III	Hwy 5, N of Vallenar	-28.01883	-70.55381	488	22.x	25.x.2010	L. Packer	PCYU
N. profuga	F	III	Hwy 5, N of Vallenar	-28.01883	-70.55381	488	22.x	25.x.2010	L. Packer	PCYU
N. profuga	F	III	Hwy 5, N of Vallenar	-28.01883	-70.55381	488	22.x	25.x.2010	L. Packer	PCYU
N. profuga	F	III	Hwy 5, N of Vallenar	-28.01883	-70.55381	488	22.x	25.x.2010	L. Packer	PCYU
N. profuga	F	III	Hwy 5, N of Vallenar	-28.01883	-70.55381	488	22.x	25.x.2010	L. Packer	PCYU
N. profuga	F	III	Hwy 5, N of Vallenar	-28.01883	-70.55381	488	22.x	25.x.2010	L. Packer	PCYU
N. profuga	F	III	Hwy 5, N of Vallenar	-28.01883	-70.55381	488	22.x	25.x.2010	L. Packer	PCYU
N. profuga	F	III	Hwy 5, N of Vallenar	-28.01883	-70.55381	488	22.x	25.x.2010	L. Packer	PCYU
N. profuga	F	III	Hwy 5, N of Vallenar	-28.01883	-70.55381	488	22.x	25.x.2010	L. Packer	PCYU
N. profuga	F	III	Hwy 5, N of Vallenar	-28.01883	-70.55381	488	22.x	25.x.2010	L. Packer	PCYU
N. profuga	F	III	Hwy 5, N of Vallenar	-28.01883	-70.55381	488	22.x	25.x.2010	L. Packer	PCYU
N. profuga	F	III	Hwy 5, N of Vallenar	-28.01883	-70.55381	488	22.x	25.x.2010	L. Packer	PCYU

N. profuga	F	III	Hwy 5, N of Vallenar	-28.01883	-70.55381	488	22.x	25.x.2010	L. Packer		PCYU
N. profuga	F	III	Hwy 5, N of Vallenar	-28.01883	-70.55381	488	22.x	25.x.2010	L. Packer		PCYU
N. profuga	F	III	N of Huasco, km 67.2	-27.92718	-71.08508	169	7.xi.2013		J. Postlethwaite & S. Monckton		PCYU
N. profuga	M	III	Finca las Herrera	-27.66756	-69.79012	2315	3.ix.2015		L. Packer	CCDB-28316 H02	PCYU
N. profuga	M	III	Finca las Herrera	-27.66756	-69.79012	2315	3.xi.2015		L. Packer		PCYU
N. profuga	F	III	Finca las Herrera	-27.66756	-69.79012	2315	3.xi.2015		L. Packer		PCYU
N. profuga	M	III	W of Finca las Salinas	-27.66738	-69.93580	1554	6.x.2010		Packer & Fraser		PCYU
N. profuga	M	III	W of Finca las Salinas	-27.66736	-69.93372	1578	20.x.2010		L. Packer		PCYU
N. profuga	M	III	Hwy 5, km 908	-27.35000	-70.63000		14.x.2009		J. Gibbs		PCYU
N. profuga	M	III	Atacama desert airport	-27.27698	-70.76376	224	14.x.2010		L Packer & E Almeida		PCYU
N. profuga	M	III	Atacama desert airport	-27.27698	-70.76376	224	14.x.2010		L Packer & E Almeida		PCYU
N. profuga	M	III	Quebrada del Potrero	-26.85686	-70.66392	348	14.x.2010		L Packer & E Almeida		PCYU
N. profuga	F	III	Quebrada del Potrero	-26.85686	-70.66392	348	1.v.2010		Packer & Fraser	B10006 E01	PCYU
N. profuga	M	III	Quebrada del Potrero	-26.85686	-70.66392	348	14.x.2010		L Packer & E Almeida		PCYU
N. profuga	F	III	S. of Inca de Oro, C-17 km 66	-26.85542	-69.89942	1825	31.x	1.xii.2014	J. Postlethwaite, L. Packer		PCYU
N. profuga	F	III	6 km E of Balneario Obispito	-26.78334	-70.74900	809	7.x	14.x.2010	L Packer & E Almeida		PCYU
N. profuga	F	III	6 km E of Balneario Obispito	-26.78334	-70.74900	809	7.x	14.x.2010	L Packer & E Almeida		PCYU
N. profuga	F	III	Cuesta Pedernales	-26.48224	-69.31545	3109	xi.2015		L. Packer	CCDB-28316 E01	PCYU
N. profuga	M	III	Cuesta Montandon	-26.45214	-69.33440	2771	19.x.2015		L. Packer		PCYU
N. profuga	F	III	Hwy C-13, E of Chañaral	-26.40601	-69.36787	2506	16.xi	9.xii.2013	J. Postlethwaite & S. Monckton		PCYU
N. profuga	F	III	E of Chañaral	-26.34116	-70.44945	332	16.x.2010		L Packer & E Almeida	B10006 H04	PCYU
N. profuga	M	IV	Hwy 5, km 562.5	-30.54000	-71.48000		20.x.2009		J. Gibbs		PCYU
N. profuga	F	IV	1.1 km S on Rd. to Tololo	-30.30580	-70.81510		11.x	22.x.2009	J. Gibbs		PCYU
N. profuga	M	IV	1.1 km S on Rd. to Tololo	-30.30580	-70.81510		11.x	22.x.2009	J. Gibbs		PCYU
N. profuga	F	IV	1.1 km S on Rd. to Tololo	-30.30580	-70.81510		11.x	22.x.2009	J. Gibbs		PCYU
N. profuga	F	IV	1.1 km S on Rd. to Tololo	-30.30580	-70.81510		11.x	22.x.2009	J. Gibbs		PCYU
N. profuga	F	IV	1.1 km S on Rd. to Tololo	-30.30580	-70.81510		11.x	22.x.2009	J. Gibbs		PCYU
N. profuga	F	IV	1.1 km S on Rd. to Tololo	-30.30580	-70.81510		11.x	22.x.2009	J. Gibbs		PCYU
N. profuga	F	IV	1.1 km S on Rd. to Tololo	-30.30580	-70.81510		11.x	22.x.2009	J. Gibbs		PCYU
N. profuga	F	IV	1.1 km S on Rd. to Tololo	-30.30580	-70.81510		11.x	22.x.2009	J. Gibbs		PCYU
N. profuga	F	IV	1.1 km S on Rd. to Tololo	-30.30580	-70.81510		11.x	22.x.2009	J. Gibbs		PCYU
N. profuga	F	IV	Chañar - Los Lavadores	-30.29630	-70.62728	1396	10.ix.2010		L. Packer	B98666 E11	PCYU
N. profuga	F	IV	Chañar	-30.28600	-70.63400		22.x.2009		J. Gibbs	B03750 H06	PCYU
N. profuga	F	IV	Chañar	-30.28000	-70.28000		11.ix	30.ix.2004	L. Packer	CCDB-03770 A05	PCYU
N. profuga	F	IV	Panque	-30.15400	-70.66400		11.ix	30.ix.2005	L. Packer	CCDB-03770 H06	PCYU
N. profuga	M	IV	Panque	-30.15400	-70.66400		11.ix	30.ix.2006	L. Packer	CCDB-03770 A04	PCYU
N. profuga	M	IV	Panque	-30.15400	-70.66400		11.ix	30.ix.2007	L. Packer	CCDB-03770 H10	PCYU
N. profuga	F	IV	Panque	-30.15400	-70.66400		11.ix	30.ix.2005	L. Packer	CCDB-15257 A12	PCYU
N. profuga	M	IV	6 km S of Vicuña	-30.10000	-70.71000		15.x.2000		L. Packer		PCYU
N. profuga	F	IV	6 km S of Vicuña	-30.10000	-70.71000		15.x.2000		L. Packer		PCYU
N. profuga	M	IV	6 km S of Vicuña	-30.10000	-70.71000		15.x.2000		L. Packer		PCYU
N. profuga	M	IV	6 km S of Vicuña	-30.10000	-70.71000		15.x.2000		L. Packer		PCYU
N. profuga	F	IV	2 km S of Vicuña	-30.07297	-70.72681	792	9.ix	18.ix.2010	L. Packer		PCYU
N. profuga	M	IV	2 km S of Vicuña	-30.07297	-70.72681	792	9.ix	18.ix.2010	L. Packer		PCYU
N. profuga	F	IV	2 km S of Vicuña	-30.07297	-70.72681	792	9.ix	18.ix.2010	L. Packer		PCYU
N. profuga	F	IV	2 km S of Vicuña	-30.07297	-70.72681	792	9.ix	18.ix.2010	L. Packer		PCYU
N. profuga	M	IV	Vicuña dump	-30.07297	-70.72681	792	8.ix	19.ix.2010	L. Packer		PCYU
N. profuga	M	IV	12 km S of Rivadavia	-30.05300	-70.49000		21.x.2009		J. Gibbs	B03750 D12	PCYU
N. profuga	M	IV	12 km S of Rivadavia	-30.05300	-70.49000		21.x.2009		J. Gibbs		PCYU

N. profuga	F	IV	12 km S of Rivadavia	-30.05300	-70.49000		21.x.2009	J. Gibbs		PCYU
N. profuga	F	IV	Vicuña	-30.04000	-70.71000			L. Packer		PCYU
N. profuga	F	IV	Rivadavia	-29.98100	-70.56220		21.x.2009	J. Gibbs		PCYU
N. profuga	F	IV	Rivadavia	-29.98100	-70.56220		21.x.2009	J. Gibbs		PCYU
N. profuga	M	IV	5.7 km W of El Trapiche	-29.34163	-71.17780	280	9.x.2010	Packer & Fraser		PCYU
N. submersa	F	I	Alto Patache	-20.82600	-70.15400	808	xi-xii.2015	L. Packer	CCDB-28312 H07	PCYU
N. submersa	M	I	Alto Patache	-20.82600	-70.15400		xi.1997	W. Sielfeld		PCYU
N. submersa	F	I	Alto Patache	-20.82600	-70.15400	800	26.x.2001	H. Larrain B.		PCYU
N. submersa	F	I	Alto Patache	-20.82600	-70.15400	750	x.2002	H. Larrain B.		PCYU

Table S6: *Callonychium* examined for biogeographic analysis.

Species	Sex	Region	Locality	Lat.	Long	Elev. (m)	Date 1	Date 2	Collector(s)	Barcode #	Collection
C. aricense1	M	I	73km SE Pozo Almonte	-20.31233	-69.12930	3137	27.iv	2.v.2013	J. Postlethwaite & S. Monckton		PCYU
C. aricense1	M	I	73km SE Pozo Almonte	-20.31233	-69.12930	3137	27.iv	2.v.2013	J. Postlethwaite & S. Monckton		PCYU
C. aricense1	M	I	73km SE Pozo Almonte	-20.31233	-69.12930	3137	27.iv	2.v.2013	J. Postlethwaite & S. Monckton		PCYU
C. aricense1	M	I	73km SE Pozo Almonte	-20.31233	-69.12930	3137	27.iv	2.v.2013	J. Postlethwaite & S. Monckton		PCYU
C. aricense1	F	I	73km SE Pozo Almonte	-20.31233	-69.12930	3137	27.iv	2.v.2013	J. Postlethwaite & S. Monckton		PCYU
C. aricense1	M	I	~73km E. Pozo Almonte	-20.31233	-69.12930	3137	10.v.2012		L. Packer		PCYU
C. aricense1	M	I	~73km E. Pozo Almonte	-20.31233	-69.12930	3137	10.v.2012		L. Packer		PCYU
C. aricense1	M	I	~73km E. Pozo Almonte	-20.31233	-69.12930	3137	10.v.2012		L. Packer		PCYU
C. aricense1	M	I	~73km E. Pozo Almonte	-20.31233	-69.12930	3137	10.v.2012		L. Packer		PCYU
C. aricense1	M	I	~73km E. Pozo Almonte	-20.31233	-69.12930	3137	10.v.2012		L. Packer		PCYU
C. aricense1	M	I	~73km E. Pozo Almonte	-20.31233	-69.12930	3137	16.v.2012		L. Packer		PCYU
C. aricense1	M	I	~73km E. Pozo Almonte	-20.31233	-69.12930	3137	16.v.2012		L. Packer		PCYU
C. aricense1	M	I	~73km E. Pozo Almonte	-20.31233	-69.12930	3137	10.v.2012		L. Packer		PCYU
C. aricense1	F	I	~73km E. Pozo Almonte	-20.31233	-69.12930	3137	10.v.2012		L. Packer		PCYU
C. aricense1	M	I	~73km E. Pozo Almonte	-20.31233	-69.12930	3137	10.v.2012		L. Packer		PCYU
C. aricense1	F	I	~73km E. Pozo Almonte	-20.31233	-69.12930	3137	10.v.2012		L. Packer		PCYU
C. aricense1	M	I	~73km E. Pozo Almonte	-20.31233	-69.12930	3137	10.v.2012		L. Packer		PCYU
C. aricense1	M	I	~73km E. Pozo Almonte	-20.31233	-69.12930	3137	10.v.2012		L. Packer		PCYU
C. aricense1	F	I	~73km E. Pozo Almonte	-20.31233	-69.12930	3137	10.v.2012		L. Packer		PCYU
C. aricense1	F	I	~73km E. Pozo Almonte	-20.31233	-69.12930	3137	10.v.2012		L. Packer		PCYU
C. aricense1	F	I	~73km E. Pozo Almonte	-20.31233	-69.12930	3137	10.v.2012		L. Packer		PCYU
C. aricense1	F	I	~73km E. Pozo Almonte	-20.31233	-69.12930	3137	10.v.2012		L. Packer		PCYU
C. aricense1	F	I	~73km E. Pozo Almonte	-20.31233	-69.12930	3137	10.v.2012		L. Packer		PCYU
C. aricense1	F	I	~73km E. Pozo Almonte	-20.31233	-69.12930	3137	10.v.2012		L. Packer		PCYU
C. aricense1	F	I	~73km E. Pozo Almonte	-20.31233	-69.12930	3137	10.v.2012		L. Packer		PCYU
C. aricense1	F	I	~73km E. Pozo Almonte	-20.31233	-69.12930	3137	10.v.2012		L. Packer		PCYU
C. aricense1	F	I	~73km E. Pozo Almonte	-20.31233	-69.12930	3137	10.v.2012		L. Packer		PCYU
C. aricense1	F	I	~73km E. Pozo Almonte	-20.31233	-69.12930	3137	10.v.2012		L. Packer		PCYU
C. aricense1	F	I	~73km E. Pozo Almonte	-20.31233	-69.12930	3137	10.v.2012		L. Packer		PCYU
C. aricense1	F	I	~73km E. Pozo Almonte	-20.31233	-69.12930	3137	10.v.2012		L. Packer		PCYU

C. aricense1	F	I	~73km E. Pozo Almonte	-20.31233	-69.12930	3137	10.v.2012		L. Packer		PCYU
C. aricense1	M	I	~73km E. Pozo Almonte	-20.31233	-69.12930	3137	10.v.2012		L. Packer		PCYU
C. aricense1	M	I	~73km E. Pozo Almonte	-20.31233	-69.12930	3137	10.v.2012		L. Packer		PCYU
C. aricense1	M	I	~73km E. Pozo Almonte	-20.31233	-69.12930	3137	10.v.2012		L. Packer		PCYU
C. aricense1	M	I	~73km E. Pozo Almonte	-20.31233	-69.12930	3137	10.v.2012		L. Packer		PCYU
C. aricense1	M	I	~73km E. Pozo Almonte	-20.31233	-69.12930	3137	10.v.2012		L. Packer		PCYU
C. aricense1	M	I	~73km E. Pozo Almonte	-20.31233	-69.12930	3137	10.v.2012		L. Packer		PCYU
C. aricense1	M	I	~73km E. Pozo Almonte	-20.31233	-69.12930	3137	10.v.2012		L. Packer		PCYU
C. aricense1	M	I	~73km E. Pozo Almonte	-20.31233	-69.12930	3137	10.v.2012		L. Packer		PCYU
C. aricense1	M	I	~73km E. Pozo Almonte	-20.31233	-69.12930	3137	10.v.2012		L. Packer		PCYU
C. aricense1	M	I	~73km E. Pozo Almonte	-20.31233	-69.12930	3137	10.v.2012		L. Packer		PCYU
C. aricense1	M	I	~73km E. Pozo Almonte	-20.31233	-69.12930	3137	10.v.2012		L. Packer		PCYU
C. aricense1	M	I	~73km E. Pozo Almonte	-20.31233	-69.12930	3137	10.v.2012		L. Packer		PCYU
C. aricense1	M	I	~73km E. Pozo Almonte	-20.31233	-69.12930	3137	10.v.2012		L. Packer		PCYU
C. aricense1	M	I	~73km E. Pozo Almonte	-20.31233	-69.12930	3137	10.v.2012		L. Packer		PCYU
C. aricense1	M	I	~73km E. Pozo Almonte	-20.31233	-69.12930	3137	10.v.2012		L. Packer		PCYU
C. aricense1	M	I	~73km E. Pozo Almonte	-20.31233	-69.12930	3137	10.v.2012		L. Packer		PCYU
C. aricense1	M	I	~73km E. Pozo Almonte	-20.31233	-69.12930	3137	10.v.2012		L. Packer		PCYU
C. aricense1	M	I	~73km E. Pozo Almonte	-20.31233	-69.12930	3137	10.v.2012		L. Packer		PCYU
C. aricense1	M	I	~73km E. Pozo Almonte	-20.31233	-69.12930	3137	10.v.2012		L. Packer		PCYU
C. aricense1	M	I	~73km E. Pozo Almonte	-20.31233	-69.12930	3137	10.v.2012		L. Packer		PCYU
C. aricense1	M	I	~73km E. Pozo Almonte	-20.31233	-69.12930	3137	10.v.2012		L. Packer		PCYU
C. aricense1	M	I	~73km E. Pozo Almonte	-20.31233	-69.12930	3137	10.v.2012		L. Packer		PCYU
C. aricense1	M	I	~73km E. Pozo Almonte	-20.31233	-69.12930	3137	10.v.2012		L. Packer		PCYU
C. aricense1	M	I	~73km E. Pozo Almonte	-20.31233	-69.12930	3137	10.v.2012		L. Packer		PCYU
C. aricense1	M	I	~73km E. Pozo Almonte	-20.31233	-69.12930	3137	10.v.2012		L. Packer		PCYU
C. aricense1	M	I	~73km E. Pozo Almonte	-20.31233	-69.12930	3137	10.v.2012		L. Packer		PCYU
C. aricense1	M	I	~73km E. Pozo Almonte	-20.31233	-69.12930	3137	10.v.2012		L. Packer		PCYU
C. aricense1	M	I	~73km E. Pozo Almonte	-20.31233	-69.12930	3137	10.v.2012		L. Packer		PCYU
C. aricense1	M	I	~73km E. Pozo Almonte	-20.31233	-69.12930	3137	10.v.2012		L. Packer		PCYU
C. aricense1	M	I	~73km E. Pozo Almonte	-20.31233	-69.12930	3137	10.v.2012		L. Packer		PCYU
C. aricense1	M	I	~73km E. Pozo Almonte	-20.31233	-69.12930	3137	10.v.2012		L. Packer		PCYU
C. aricense1	M	I	~73km E. Pozo Almonte	-20.31233	-69.12930	3137	10.v.2012		L. Packer		PCYU
C. aricense1	M	I	~73km E. Pozo Almonte	-20.31233	-69.12930	3137	10.v.2012		L. Packer		PCYU
C. aricense1	M	I	~73km E. Pozo Almonte	-20.31233	-69.12930	3137	10.v.2012		L. Packer		PCYU
C. aricense1	M	I	~73km E. Pozo Almonte	-20.31233	-69.12930	3137	10.v.2012		L. Packer		PCYU
C. aricense1	M	I	~73km E. Pozo Almonte	-20.31233	-69.12930	3137	10.v.2012		L. Packer		PCYU
C. aricense1	M	I	~73km E. Pozo Almonte	-20.31233	-69.12930	3137	10.v.2012		L. Packer		PCYU
C. aricense1	F	I	~73km E. Pozo Almonte	-20.31233	-69.12930	3137	10.v.2012		L. Packer		PCYU
C. aricense1	F	I	~73km E. Pozo Almonte	-20.31233	-69.12930	3137	10.v.2012		L. Packer		PCYU
C. aricense1	M	I	Hwy 687, E. of Pozo Almonte	-20.29873	-69.14114	3004	9.iv	27.iv.2013	J. Postlethwaite & S. Monckton	CCDB-22789 H11	PCYU
C. aricense1	F	I	Hwy 687, E. of Pozo Almonte	-20.29873	-69.14114	3004	6.ii	9.iv.2013	J. Postlethwaite & S. Monckton		PCYU
C. aricense1	M	I	Hwy 687, E. of Pozo Almonte	-20.29873	-69.14114	3004	6.ii	9.iv.2013	J. Postlethwaite & S. Monckton		PCYU
C. aricense1	M	I	Hwy 687, E. of Pozo Almonte	-20.29873	-69.14114	3004	6.ii	9.iv.2013	J. Postlethwaite & S. Monckton		PCYU
C. aricense1	F	I	Hwy 687, E. of Pozo Almonte	-20.29873	-69.14114	3004	6.ii	9.iv.2013	J. Postlethwaite & S. Monckton		PCYU
C. aricense1	M	I	Hwy 687, E. of Pozo Almonte	-20.29873	-69.14114	3004	6.ii	9.iv.2013	J. Postlethwaite & S. Monckton		PCYU
C. aricense1	M	I	Hwy 687, E. of Pozo Almonte	-20.29873	-69.14114	3004	6.ii	9.iv.2013	J. Postlethwaite & S. Monckton		PCYU
C. aricense1	M	I	Hwy 687, E. of Pozo Almonte	-20.29873	-69.14114	3004	6.ii	9.iv.2013	J. Postlethwaite & S. Monckton		PCYU
C. aricense1	M	I	Hwy 687, E. of Pozo Almonte	-20.29873	-69.14114	3004	6.ii	9.iv.2013	J. Postlethwaite & S. Monckton		PCYU

C. aricense1	M	I	Hwy 687, E. of Pozo Almonte	-20.29873	-69.14114	3004	6.ii	9.iv.2013	J. Postlethwaite & S. Monckton		PCYU
C. aricense1	F	I	Hwy 687, E. of Pozo Almonte	-20.29873	-69.14114	3004	6.ii	9.iv.2013	J. Postlethwaite & S. Monckton		PCYU
C. aricense1	M	I	Hwy 687, E. of Pozo Almonte	-20.29873	-69.14114	3004	6.ii	9.iv.2013	J. Postlethwaite & S. Monckton		PCYU
C. aricense1	M	I	Hwy 687, E. of Pozo Almonte	-20.29873	-69.14114	3004	6.ii	9.iv.2013	J. Postlethwaite & S. Monckton		PCYU
C. aricense1	F	I	Hwy 687, E. of Pozo Almonte	-20.29873	-69.14114	3004	6.ii	9.iv.2013	J. Postlethwaite & S. Monckton		PCYU
C. aricense1	M	I	Hwy 687, E. of Pozo Almonte	-20.29873	-69.14114	3004	6.ii	9.iv.2013	J. Postlethwaite & S. Monckton		PCYU
C. aricense1	F	I	Hwy 687, E. of Pozo Almonte	-20.29873	-69.14114	3004	6.ii	9.iv.2013	J. Postlethwaite & S. Monckton		PCYU
C. aricense1	M	I	Hwy 687, E. of Pozo Almonte	-20.29873	-69.14114	3004	6.ii	9.iv.2013	J. Postlethwaite & S. Monckton		PCYU
C. aricense1	M	I	Hwy 687, E. of Pozo Almonte	-20.29873	-69.14114	3004	6.ii	9.iv.2013	J. Postlethwaite & S. Monckton		PCYU
C. aricense1	M	I	Hwy 687, E. of Pozo Almonte	-20.29873	-69.14114	3004	6.ii	9.iv.2013	J. Postlethwaite & S. Monckton		PCYU
C. aricense1	F	I	Hwy 687, E. of Pozo Almonte	-20.29873	-69.14114	3004	23.ix	28.x.2013	J. Postlethwaite & S. Monckton		PCYU
C. aricense1	M	I	Hwy 687, E. of Pozo Almonte	-20.29873	-69.14114	3004	6.ii	9.iv.2013	J. Postlethwaite & S. Monckton		PCYU
C. aricense1	F	I	Hwy 687, E. of Pozo Almonte	-20.29873	-69.14114	3004	6.ii	9.iv.2013	J. Postlethwaite & S. Monckton		PCYU
C. aricense1	M	I	Hwy 687, E. of Pozo Almonte	-20.29873	-69.14114	3004	6.ii	9.iv.2013	J. Postlethwaite & S. Monckton		PCYU
C. aricense1	M	I	Hwy 687, E. of Pozo Almonte	-20.29873	-69.14114	3004	6.ii	9.iv.2013	J. Postlethwaite & S. Monckton		PCYU
C. aricense1	M	I	Hwy 687, E. of Pozo Almonte	-20.29873	-69.14114	3004	6.ii	9.iv.2013	J. Postlethwaite & S. Monckton		PCYU
C. aricense1	M	I	Hwy 687, E. of Pozo Almonte	-20.29873	-69.14114	3004	6.ii	9.iv.2013	J. Postlethwaite & S. Monckton		PCYU
C. aricense1	M	I	Hwy 687, E. of Pozo Almonte	-20.29873	-69.14114	3004	6.ii	9.iv.2013	J. Postlethwaite & S. Monckton		PCYU
C. aricense1	M	I	Hwy 687, E. of Pozo Almonte	-20.29873	-69.14114	3004	6.ii	9.iv.2013	J. Postlethwaite & S. Monckton		PCYU
C. aricense1	M	I	Hwy 687, E. of Pozo Almonte	-20.29873	-69.14114	3004	6.ii	9.iv.2013	J. Postlethwaite & S. Monckton		PCYU
C. aricense1	F	I	Hwy 687, E. of Pozo Almonte	-20.29873	-69.14114	3004	6.ii	9.iv.2013	J. Postlethwaite & S. Monckton		PCYU
C. aricense1	F	I	Hwy 687, E. of Pozo Almonte	-20.29873	-69.14114	3004	6.ii	9.iv.2013	J. Postlethwaite & S. Monckton		PCYU
C. aricense1	F	I	Hwy 687, E. of Pozo Almonte	-20.29873	-69.14114	3004	6.ii	9.iv.2013	J. Postlethwaite & S. Monckton		PCYU
C. aricense1	F	I	Hwy 687, E. of Pozo Almonte	-20.29873	-69.14114	3004	6.ii	9.iv.2013	J. Postlethwaite & S. Monckton		PCYU
C. aricense1	F	I	Hwy 687, E. of Pozo Almonte	-20.29873	-69.14114	3004	6.ii	9.iv.2013	J. Postlethwaite & S. Monckton		PCYU
C. aricense1	M	I	71km E. Pozo Almonte	-20.29732	-69.14223	2969	14.iv	21.iv.2012	L. Packer		PCYU
C. aricense1	M	I	71km E. Pozo Almonte	-20.29732	-69.14223	2969	14.iv	21.iv.2012	L. Packer		PCYU
C. aricense1	M	I	71km E. Pozo Almonte	-20.29732	-69.14223	2969	10.v.2012		L. Packer		PCYU
C. aricense1	M	I	71km E. Pozo Almonte	-20.29732	-69.14223	2969	10.v.2012		L. Packer		PCYU
C. aricense1	M	I	71km E. Pozo Almonte	-20.29732	-69.14223	2969	10.v.2012		L. Packer		PCYU
C. aricense1	M	I	71km E. Pozo Almonte	-20.29732	-69.14223	2969	14.iv	21.iv.2012	L. Packer		PCYU
C. aricense1	M	I	71km E. Pozo Almonte	-20.29732	-69.14223	2969	14.iv	21.iv.2012	L. Packer		PCYU
C. aricense1	M	I	71km E. Pozo Almonte	-20.29732	-69.14223	2969	15.iv.2012		L. Packer		PCYU
C. aricense1	M	I	71km E. Pozo Almonte	-20.29732	-69.14223	2969	14.iv	21.iv.2012	L. Packer		PCYU
C. aricense1	M	I	71km E. Pozo Almonte	-20.29732	-69.14223	2969	14.iv	21.iv.2012	L. Packer		PCYU
C. aricense1	M	I	71km E. Pozo Almonte	-20.29732	-69.14223	2969	14.iv	21.iv.2012	L. Packer		PCYU
C. aricense1	M	I	71km E. Pozo Almonte	-20.29732	-69.14223	2969	14.iv	21.iv.2012	L. Packer		PCYU
C. aricense1	M	I	71km E. Pozo Almonte	-20.29732	-69.14223	2969	14.iv	21.iv.2012	L. Packer		PCYU
C. aricense1	M	I	71km E. Pozo Almonte	-20.29732	-69.14223	2969	14.iv	21.iv.2012	L. Packer		PCYU
C. aricense1	M	I	71km E. Pozo Almonte	-20.29732	-69.14223	2969	14.iv	21.iv.2012	L. Packer		PCYU
C. aricense1	M	I	71km E. Pozo Almonte	-20.29732	-69.14223	2969	14.iv	21.iv.2012	L. Packer		PCYU
C. aricense1	M	I	71km E. Pozo Almonte	-20.29732	-69.14223	2969	14.iv	21.iv.2012	L. Packer		PCYU
C. aricense1	M	I	71km E. Pozo Almonte	-20.29732	-69.14223	2969	14.iv	21.iv.2012	L. Packer		PCYU
C. aricense1	M	I	71km E. Pozo Almonte	-20.29732	-69.14223	2969	14.iv	21.iv.2012	L. Packer		PCYU
C. aricense1	M	I	71km E. Pozo Almonte	-20.29732	-69.14223	2969	14.iv	21.iv.2012	L. Packer		PCYU
C. aricense1	M	I	71km E. Pozo Almonte	-20.29732	-69.14223	2969	14.iv	21.iv.2012	L. Packer		PCYU
C. aricense1	M	I	71km E. Pozo Almonte	-20.29732	-69.14223	2969	14.iv	21.iv.2012	L. Packer		PCYU
C. aricense1	M	I	71km E. Pozo Almonte	-20.29732	-69.14223	2969	14.iv	21.iv.2012	L. Packer		PCYU
C. aricense1	M	I	71km E. Pozo Almonte	-20.29732	-69.14223	2969	14.iv	21.iv.2012	L. Packer		PCYU

C. aricense1	M	I	71km E. Pozo Almonte	-20.29732	-69.14223	2969	14.iv	21.iv.2012	L. Packer		PCYU
C. aricense1	M	I	71km E. Pozo Almonte	-20.29732	-69.14223	2969	14.iv	21.iv.2012	L. Packer		PCYU
C. aricense1	M	I	71km E. Pozo Almonte	-20.29732	-69.14223	2969	14.iv	21.iv.2012	L. Packer		PCYU
C. aricense1	M	I	71km E. Pozo Almonte	-20.29732	-69.14223	2969	14.iv	21.iv.2012	L. Packer		PCYU
C. aricense1	M	I	69km E. Pozo Almonte	-20.29127	-69.16866		16.iv.2012		L. Packer		PCYU
C. aricense1	M	I	~62km E. Pozo Almonte	-20.28928	-69.21951	2464	15.iv	16.iv.2012	L. Packer		PCYU
C. aricense1	M	I	~62km E. Pozo Almonte	-20.28928	-69.21951	2464	15.iv	16.iv.2012	L. Packer		PCYU
C. aricense1	M	I	~62km E. Pozo Almonte	-20.28928	-69.21951	2464	15.iv	16.iv.2012	L. Packer		PCYU
C. aricense1	F	I	~62km E. Pozo Almonte	-20.28928	-69.21951	2464	15.iv	16.iv.2012	L. Packer		PCYU
C. aricense1	M	I	~62km E. Pozo Almonte	-20.28928	-69.21951	2464	15.iv	16.iv.2012	L. Packer		PCYU
C. aricense1	F	I	~62km E. Pozo Almonte	-20.28928	-69.21951	2464	10.v.2012		L. Packer		PCYU
C. aricense1	F	I	~62km E. Pozo Almonte	-20.28928	-69.21951	2464	10.v.2012		L. Packer		PCYU
C. aricense1	F	I	~62km E. Pozo Almonte	-20.28928	-69.21951	2464	10.v.2012		L. Packer		PCYU
C. aricense1	F	I	~62km E. Pozo Almonte	-20.28928	-69.21951	2464	10.v.2012		L. Packer		PCYU
C. aricense1	M	I	~62km E. Pozo Almonte	-20.28928	-69.21951	2464	10.v.2012		L. Packer		PCYU
C. aricense1	M	I	~62km E. Pozo Almonte	-20.28928	-69.21951	2464	10.v.2012		L. Packer		PCYU
C. aricense1	M	I	~62km E. Pozo Almonte	-20.28928	-69.21951	2464	10.v.2012		L. Packer		PCYU
C. aricense1	F	I	~62km E. Pozo Almonte	-20.28928	-69.21951	2464	10.v.2012		L. Packer		PCYU
C. aricense1	M	I	~62km E. Pozo Almonte	-20.28928	-69.21951	2464	10.v.2012		L. Packer		PCYU
C. aricense1	F	I	~62km E. Pozo Almonte	-20.28928	-69.21951	2464	10.v.2012		L. Packer		PCYU
C. aricense1	F	I	~62km E. Pozo Almonte	-20.28928	-69.21951	2464	10.v.2012		L. Packer		PCYU
C. aricense1	F	I	~62km E. Pozo Almonte	-20.28928	-69.21951	2464	10.v.2012		L. Packer		PCYU
C. aricense1	M	I	~62km E. Pozo Almonte	-20.28928	-69.21951	2464	10.v.2012		L. Packer		PCYU
C. aricense1	F	I	~62km E. Pozo Almonte	-20.28928	-69.21951	2464	10.v.2012		L. Packer		PCYU
C. aricense1	M	I	~62km E. Pozo Almonte	-20.28928	-69.21951	2464	10.v.2012		L. Packer		PCYU
C. aricense1	F	I	~62km E. Pozo Almonte	-20.28928	-69.21951	2464	10.v.2012		L. Packer		PCYU
C. aricense1	M	I	~62km E. Pozo Almonte	-20.28928	-69.21951	2464	10.v.2012		L. Packer		PCYU
C. aricense1	M	I	~62km E. Pozo Almonte	-20.28928	-69.21951	2464	10.v.2012		L. Packer		PCYU
C. aricense1	F	I	~62km E. Pozo Almonte	-20.28928	-69.21951	2464	10.v.2012		L. Packer		PCYU
C. aricense1	F	I	~62km E. Pozo Almonte	-20.28928	-69.21951	2464	10.v.2012		L. Packer		PCYU
C. aricense1	F	I	~62km E. Pozo Almonte	-20.28928	-69.21951	2464	10.v.2012		L. Packer		PCYU
C. aricense1	M	I	~62km E. Pozo Almonte	-20.28928	-69.21951	2464	10.v.2012		L. Packer		PCYU
C. aricense1	M	I	~62km E. Pozo Almonte	-20.28928	-69.21951	2464	15.iv	16.iv.2012	L. Packer		PCYU
C. aricense1	F	I	~62km E. Pozo Almonte	-20.28928	-69.21951	2464	10.v.2012		L. Packer		PCYU
C. aricense1	F	I	~62km E. Pozo Almonte	-20.28928	-69.21951	2464	10.v.2012		L. Packer		PCYU
C. aricense1	F	I	~62km E. Pozo Almonte	-20.28928	-69.21951	2464	10.v.2012		L. Packer		PCYU
C. aricense1	M	I	~62km E. Pozo Almonte	-20.28928	-69.21951	2464	15.iv	16.iv.2012	L. Packer		PCYU
C. aricense1	F	I	~62km E. Pozo Almonte	-20.28928	-69.21951	2464	15.iv	16.iv.2012	L. Packer		PCYU
C. aricense1	M	I	~62km E. Pozo Almonte	-20.28928	-69.21951	2464	15.iv	16.iv.2012	L. Packer		PCYU
C. aricense1	M	I	~62km E. Pozo Almonte	-20.28928	-69.21951	2464	15.iv	16.iv.2012	L. Packer		PCYU
C. aricense1	M	I	~62km E. Pozo Almonte	-20.28928	-69.21951	2464	15.iv	16.iv.2012	L. Packer		PCYU
C. aricense1	M	I	~62km E. Pozo Almonte	-20.28928	-69.21951	2464	15.iv	16.iv.2012	L. Packer		PCYU
C. aricense1	M	I	~62km E. Pozo Almonte	-20.28928	-69.21951	2464	15.iv	16.iv.2012	L. Packer		PCYU
C. aricense1	M	I	~62km E. Pozo Almonte	-20.28928	-69.21951	2464	15.iv	16.iv.2012	L. Packer		PCYU
C. aricense1	M	I	~62km E. Pozo Almonte	-20.28928	-69.21951	2464	10.v.2012		L. Packer		PCYU
C. aricense1	M	I	~62km E. Pozo Almonte	-20.28928	-69.21951	2464	10.v.2012		L. Packer		PCYU
C. aricense1	M	I	Hwy 687	-20.25203	-69.58144	1047	6.ii	8.iv.2013	J. Postlethwaite & S. Monckton	CCDB-22789 G11	PCYU
C. aricense1	M	I	Hwy 687	-20.25203	-69.58144	1047	8.iv	27.iv.2013	J. Postlethwaite & S. Monckton		PCYU
C. aricense1	M	I	Hwy 687	-20.25203	-69.58144	1047	8.iv	27.iv.2013	J. Postlethwaite & S. Monckton		PCYU

C. aricense1	M	I	Hwy 687	-20.25203	-69.58144	1047	6.ii	8.iv.2013	J. Postlethwaite & S. Monckton		PCYU
C. aricense1	M	I	Hwy 687	-20.25203	-69.58144	1047	8.iv	27.iv.2013	J. Postlethwaite & S. Monckton		PCYU
C. aricense1	M	I	Hwy 687	-20.25203	-69.58144	1047	8.iv	27.iv.2013	J. Postlethwaite & S. Monckton		PCYU
C. aricense1	M	I	Hwy 687	-20.25203	-69.58144	1047	8.iv	27.iv.2013	J. Postlethwaite & S. Monckton		PCYU
C. aricense1	M	I	Hwy 687	-20.25203	-69.58144	1047	6.ii	8.iv.2013	J. Postlethwaite & S. Monckton		PCYU
C. aricense1	M	I	Hwy 687, E. of Pozo Almonte	-20.25136	-69.60275	1052	22.ix	28.x.2013	J. Postlethwaite & S. Monckton		PCYU
C. aricense1	M	I	Hwy 687, E. of Pozo Almonte	-20.25136	-69.60275	1052	28.x	2.xii.2013	J. Postlethwaite & S. Monckton		PCYU
C. aricense1	M	I	Hwy 687, E. of Pozo Almonte	-20.25136	-69.60275	1052	22.ix	28.x.2013	J. Postlethwaite & S. Monckton		PCYU
C. aricense1	M	I	S. of Cerro Colorado	-20.08888	-69.28450	2386	21.iv	10.v.2012	L. Packer		PCYU
C. aricense1	M	I	Maniña	-20.07684	-69.20460	2803	6.iv	26.iv.2013	J. Postlethwaite & S. Monckton		PCYU
C. aricense1	M	I	Hwy A-65, Mamiña	-20.06972	-69.21962	2698	5.ii	6.iv.2013	J. Postlethwaite & S. Monckton		PCYU
C. aricense1	F	I	Hwy A-65, Mamiña	-20.06972	-69.21962	2698	5.ii	6.iv.2013	J. Postlethwaite & S. Monckton		PCYU
C. aricense1	F	I	Hwy A-65, Mamiña	-20.06972	-69.21962	2698	5.ii	6.iv.2013	J. Postlethwaite & S. Monckton		PCYU
C. aricense1	F	I	4 km W. of Mamiña	-20.06371	-69.23058	2683	16.iv	21.v.2012	L. Packer		PCYU
C. aricense1	F	I	4 km W. of Mamiña	-20.06371	-69.23058	2683	16.iv	21.v.2012	L. Packer		PCYU
C. aricense1	F	I	4 km W. of Mamiña	-20.06371	-69.23058	2683	16.iv	21.v.2012	L. Packer		PCYU
C. aricense1	F	I	4 km W. of Mamiña	-20.06371	-69.23058	2683	16.iv	21.v.2012	L. Packer		PCYU
C. aricense1	M	I	4 km W. of Mamiña	-20.06371	-69.23058	2683	16.iv	21.v.2012	L. Packer		PCYU
C. aricense1	M	I	4 km W. of Mamiña	-20.06371	-69.23058	2683	16.iv	21.v.2012	L. Packer		PCYU
C. aricense1	M	I	4 km W. of Mamiña	-20.06371	-69.23058	2683	16.iv	21.v.2012	L. Packer		PCYU
C. aricense1	M	I	4 km W. of Mamiña	-20.06371	-69.23058	2683	16.iv	21.v.2012	L. Packer		PCYU
C. aricense1	M	I	4 km W. of Mamiña	-20.06371	-69.23058	2683	16.iv	21.v.2012	L. Packer		PCYU
C. aricense1	M	I	4 km W. of Mamiña	-20.06371	-69.23058	2683	16.iv	21.v.2012	L. Packer		PCYU
C. aricense1	M	I	4 km W. of Mamiña	-20.06371	-69.23058	2683	16.iv	21.v.2012	L. Packer		PCYU
C. aricense1	M	I	4 km W. of Mamiña	-20.06371	-69.23058	2683	16.iv	21.v.2012	L. Packer		PCYU
C. aricense1	M	I	4 km W. of Mamiña	-20.06371	-69.23058	2683	16.iv	21.v.2012	L. Packer		PCYU
C. aricense1	M	I	4 km W. of Mamiña	-20.06371	-69.23058	2683	16.iv	21.v.2012	L. Packer		PCYU
C. aricense1	M	I	4 km W. of Mamiña	-20.06371	-69.23058	2683	16.iv	21.v.2012	L. Packer		PCYU
C. aricense1	M	I	4 km W. of Mamiña	-20.06371	-69.23058	2683	16.iv	21.v.2012	L. Packer		PCYU
C. aricense1	M	I	Mamiña vertedero	-20.06175	-69.22181	2660	16.iv	21.iv.2012	L. Packer		PCYU
C. aricense1	F	I	Mamiña vertedero	-20.06175	-69.22181	2660	16.iv	21.iv.2012	L. Packer		PCYU
C. aricense1	M	I	Mamiña vertedero	-20.06175	-69.22181	2660	16.iv	21.iv.2012	L. Packer		PCYU
C. aricense1	M	I	Mamiña vertedero	-20.06175	-69.22181	2660	16.iv	21.iv.2012	L. Packer		PCYU
C. aricense1	M	I	Mamiña	-19.78340	-69.28724	2657	14.iv	24.iv.2013	J. Postlethwaite & S. Monckton	CCDB-22788 G02	PCYU
C. aricense1	F	I	CH-15 km 60	-19.78340	-69.28724	2657	14.iv	24.iv.2013	J. Postlethwaite & S. Monckton		PCYU
C. aricense1	M	II	Aquas Blancas S.E. of S.P. de Atacama	-23.26700	-68.00000	2450	iv.2004		L. Packer		PCYU
C. aricense1	F	II	27-CH, km 13.6	-22.92132	-68.05896	2657	28.iv	2.v.2013	J. Postlethwaite & S. Monckton		PCYU
C. aricense1	M	II	27-CH, km 13.6	-22.92132	-68.05896	2657	28.iv	2.v.2013	J. Postlethwaite & S. Monckton		PCYU
C. aricense1	M	II	27-CH, km 13.6	-22.92132	-68.05896	2657	28.iv	2.v.2013	J. Postlethwaite & S. Monckton		PCYU
C. aricense1	F	II	27-CH, km 13.6	-22.92132	-68.05896	2657	28.iv	2.v.2013	J. Postlethwaite & S. Monckton	CCDB-22789 G07	PCYU
C. aricense1	F	II	Pozo 3 San Pedro de Atacama	-22.91449	-68.16566	2429	iv.2012		L. Packer		PCYU
C. aricense1	M	II	Hwy 27-CH, km 19.9	-22.91061	-68.00141	3045	24.i	6.iv.2013	J. Postlethwaite & S. Monckton		PCYU
C. aricense1	M	II	Hwy 27-CH, km 19.9	-22.91061	-68.00141	3045	24.i	6.iv.2013	J. Postlethwaite & S. Monckton		PCYU
C. aricense1	M	II	Hwy 27-CH, km 19.9	-22.91061	-68.00141	3045	24.i	6.iv.2013	J. Postlethwaite & S. Monckton		PCYU
C. aricense1	M	II	Hwy 27-CH, km 19.9	-22.91061	-68.00141	3045	24.i	6.iv.2013	J. Postlethwaite & S. Monckton		PCYU
C. aricense1	M	II	Hwy 27-CH, km 19.9	-22.91061	-68.00141	3045	6.iv	28.iv.2013	J. Postlethwaite & S. Monckton		PCYU
C. aricense1	M	II	Llanos de la Paciencia	-22.87503	-68.30177	2386	12.iv	21.iv.2012	L. Packer		PCYU
C. aricense1	M	II	Llanos de la Paciencia	-22.87503	-68.30177	2386	12.iv	21.iv.2012	L. Packer		PCYU
C. aricense1	F	II	N. of SP de Atacama, B245 km 12	-22.82718	-68.12890	2801	21.xi	6.xii.2013	J. Postlethwaite & S. Monckton	CCDB-22789 G01	PCYU

C. aricense1	M	II	N. of SP de Atacama, B245 km 12	-22.82718	-68.12890	2801	21.xi	6.xii.2013	J. Postlethwaite & S. Monckton	PCYU
C. aricense1	M	II	N. of SP de Atacama, B245 km 12	-22.82718	-68.12890	2801	21.xi	6.xii.2013	J. Postlethwaite & S. Monckton	PCYU
C. aricense1	F	II	N. of SP de Atacama, B245 km 12	-22.82718	-68.12890	2801	21.xi	6.xii.2013	J. Postlethwaite & S. Monckton	PCYU
C. aricense1	M	II	N. of SP de Atacama, B245 km 12	-22.82718	-68.12890	2801	20.xi	21.xi.2013	J. Postlethwaite & S. Monckton	PCYU
C. aricense1	M	XV	Timar A-35	-18.75118	-69.70213	2414	17.iv	1.v.2013	J. Postlethwaite & S. Monckton	CCDB-22791 H11 PCYU
C. aricense1	M	XV	Timar A-35	-18.75118	-69.70213	2414	17.iv	1.v.2013	J. Postlethwaite & S. Monckton	PCYU
C. aricense1	M	XV	Hwy 31 55km, Pampa de Chaca	-18.74308	-69.76807	2081	20.iv.2012		L. Packer	PCYU
C. aricense1	M	XV	Hwy 11 65km	-18.47355	-69.84498	1935	19.iv	12.v.2012	L. Packer	PCYU
C. aricense1	M	XV	Quebrada Cardones	-18.46403	-69.80427	2189	17.iv	12.v.2012	L. Packer	PCYU
C. aricense1	M	XV	Hwy 11,72.5km	-18.45698	-69.77264	2378	17.iv.2012		L. Packer	PCYU
C. aricense1	M	XV	Hwy 11,72.5km	-18.45698	-69.77264	2378	17.iv.2012		L. Packer	PCYU
C. aricense1	M	XV	Quebrada Cardones	-18.45698	-69.77264	2378	13.v.2012			PCYU
C. aricense1	M	XV	Quebrada Cardones	-18.45698	-69.77264	2378	17.iv.2012		L. Packer	PCYU
C. aricense1	F	XV	Quebrada Cardones	-18.45698	-69.77264	2378	13.v.2012		L. Packer	PCYU
C. aricense1	F	XV	Quebrada Cardones	-18.45698	-69.77264	2378	13.v.2012		L. Packer	PCYU
C. aricense1	F	XV	Quebrada Cardones	-18.44759	-69.76234	2443	18.iv.2012		L. Packer	PCYU
C. aricense1	M	XV	Quebrada Cardones	-18.43780	-69.74481	2618	17.iv.2012		L. Packer	PCYU
C. aricense1	M	XV	Quebrada Cardones	-18.43780	-69.74481	2618	17.iv.2012		L. Packer	PCYU
C. aricense1	F	XV	Quebrada Cardones	-18.43780	-69.74481	2618	17.iv.2012		L. Packer	PCYU
C. aricense1	M		Mamiña vertedero	-20.06371	-69.23058	2683	21.iv	10.v.2012	L. Packer	PCYU
C. aricense2	M	I	Alto Patache	-20.82580	-70.15410	808	xi	xii.2015	L. Packer	PCYU
C. aricense2	F	I	Alto Patache	-20.82580	-70.15410	808	xi	xii.2015	L. Packer	PCYU
C. aricense2	M	I	Palo Buque	-20.38200	-70.14900	479	27.x.2015		L. Packer	CCDB-28316 D10 PCYU
C. aricense2	M	I	~73km E. Pozo Almonte	-20.31233	-69.12930	3137	10.v.2012		L. Packer	PCYU
C. aricense2	M	I	~73km E. Pozo Almonte	-20.31233	-69.12930	3137	10.v.2012		L. Packer	PCYU
C. aricense2	M	I	~73km E. Pozo Almonte	-20.31233	-69.12930	3137	10.v.2012		L. Packer	PCYU
C. aricense2	M	I	Mamiña vertedero	-20.30882	-69.04198	2660	21.iv	10.v.2012	L. Packer	PCYU
C. aricense2	M	I	Mamiña vertedero	-20.30882	-69.04198	2660	21.iv	10.v.2012	L. Packer	PCYU
C. aricense2	M	I	Mamiña vertedero	-20.30882	-69.04198	2660	21.iv	10.v.2012	L. Packer	PCYU
C. aricense2	F	I	Mamiña vertedero	-20.30882	-69.04198	2660	21.iv	10.v.2012	L. Packer	PCYU
C. aricense2	M	I	71km E. Pozo Almonte	-20.29732	-69.14223	2969	10.v.2012		L. Packer	PCYU
C. aricense2	M	I	71km E. Pozo Almonte	-20.29732	-69.14223	2969	14.iv	21.iv.2012	L. Packer	PCYU
C. aricense2	F	I	71km E. Pozo Almonte	-20.29732	-69.14223	2969	14.iv	21.iv.2012	L. Packer	PCYU
C. aricense2	M	I	71km E. Pozo Almonte	-20.29732	-69.14223	2969	14.iv	21.iv.2012	L. Packer	PCYU
C. aricense2	M	I	71km E. Pozo Almonte	-20.29732	-69.14223	2969	14.iv	21.iv.2012	L. Packer	PCYU
C. aricense2	M	I	71km E. Pozo Almonte	-20.29732	-69.14223	2969	14.iv	21.iv.2012	L. Packer	PCYU
C. aricense2	M	I	~62km E. Pozo Almonte	-20.28928	-69.21951	2464	10.v.2012		L. Packer	PCYU
C. aricense2	M	I	~62km E. Pozo Almonte	-20.28928	-69.21951	2464	15.iv	16.iv.2012	L. Packer	PCYU
C. aricense2	F	I	Hwy 687, km 63	-20.28870	-69.21086	2505	6.ii	9.iv.2013	J. Postlethwaite & S. Monckton	CCDB-22789 G04 PCYU
C. aricense2	F	I	Hwy 687, km 63	-20.28870	-69.21086	2505	6.ii	9.iv.2013	J. Postlethwaite & S. Monckton	CCDB-22788 G03 PCYU
C. aricense2	F	I	Hwy 687, km 63	-20.28870	-69.21086	2505	6.ii	9.iv.2013	J. Postlethwaite & S. Monckton	PCYU
C. aricense2	F	I	Hwy 687, km 63	-20.28870	-69.21086	2505	6.ii	9.iv.2013	J. Postlethwaite & S. Monckton	PCYU
C. aricense2	M	I	Hwy 687, km 63	-20.28870	-69.21086	2505	6.ii	9.iv.2013	J. Postlethwaite & S. Monckton	PCYU
C. aricense2	F	I	Hwy 687, km 63	-20.28870	-69.21086	2505	6.ii	9.iv.2013	J. Postlethwaite & S. Monckton	PCYU
C. aricense2	F	I	Hwy 687, km 63	-20.28870	-69.21086	2505	6.ii	9.iv.2013	J. Postlethwaite & S. Monckton	PCYU
C. aricense2	F	I	Hwy 687, km 63	-20.28870	-69.21086	2505	6.ii	9.iv.2013	J. Postlethwaite & S. Monckton	PCYU
C. aricense2	M	I	Cerro Colorado	-20.09019	-69.31075	2222	21.iv.2012		L. Packer	PCYU
C. aricense2	F	I	Cerro Colorado	-20.09019	-69.31075	2222	21.iv.2012		L. Packer	PCYU

C. aricense2	M	I	Cerro Colorado	-20.09019	-69.31075	2222	21.iv.2012		L. Packer	PCYU
C. aricense2	M	I	S. of Cerro Colorado	-20.08888	-69.28450	2386	21.iv	10.v.2012	L. Packer	PCYU
C. aricense2	F	I	S. of Cerro Colorado	-20.08888	-69.28450	2386	21.iv	10.v.2012	L. Packer	PCYU
C. aricense2	F	I	S. of Cerro Colorado	-20.08888	-69.28450	2386	21.iv	10.v.2012	L. Packer	PCYU
C. aricense2	M	I	S. of Cerro Colorado	-20.08888	-69.28450	2386	21.iv	10.v.2012	L. Packer	PCYU
C. aricense2	M	I	S. of Cerro Colorado	-20.08888	-69.28450	2386	21.iv	10.v.2012	L. Packer	PCYU
C. aricense2	M	I	S. of Cerro Colorado	-20.08888	-69.28450	2386	21.iv	10.v.2012	L. Packer	PCYU
C. aricense2	M	I	S. of Cerro Colorado	-20.08888	-69.28450	2386	21.iv	10.v.2012	L. Packer	PCYU
C. aricense2	M	I	S. of Cerro Colorado	-20.08888	-69.28450	2386	21.iv	10.v.2012	L. Packer	PCYU
C. aricense2	M	I	S. of Cerro Colorado	-20.08888	-69.28450	2386	21.iv	10.v.2012	L. Packer	PCYU
C. aricense2	M	I	S. of Cerro Colorado	-20.08888	-69.28450	2386	21.iv	10.v.2012	L. Packer	PCYU
C. aricense2	F	I	S. of Cerro Colorado	-20.08888	-69.28450	2386	21.iv	10.v.2012	L. Packer	PCYU
C. aricense2	F	I	S. of Cerro Colorado	-20.08888	-69.28450	2386	21.iv	10.v.2012	L. Packer	PCYU
C. aricense2	F	I	S. of Cerro Colorado	-20.08888	-69.28450	2386	21.iv	10.v.2012	L. Packer	PCYU
C. aricense2	F	I	S. of Cerro Colorado	-20.08888	-69.28450	2386	21.iv	10.v.2012	L. Packer	PCYU
C. aricense2	M	I	4km W. of Mamiña	-20.06371	-69.23058	2683	21.iv	10.v.2012	L. Packer	PCYU
C. aricense2	M	I	4km W. of Mamiña	-20.06371	-69.23058	2683	21.iv	10.v.2012	L. Packer	PCYU
C. aricense2	M	I	4km W. of Mamiña	-20.06371	-69.23058	2683	21.iv	10.v.2012	L. Packer	PCYU
C. aricense2	M	I	4km W. of Mamiña	-20.06371	-69.23058	2683	21.iv	10.v.2012	L. Packer	PCYU
C. aricense2	M	I	4km W. of Mamiña	-20.06371	-69.23058	2683	21.iv	10.v.2012	L. Packer	PCYU
C. aricense2	M	I	4km W. of Mamiña	-20.06371	-69.23058	2683	21.iv	10.v.2012	L. Packer	PCYU
C. aricense2	M	I	4km W. of Mamiña	-20.06371	-69.23058	2683	21.iv	10.v.2012	L. Packer	PCYU
C. aricense2	M	I	4km W. of Mamiña	-20.06371	-69.23058	2683	21.iv	10.v.2012	L. Packer	PCYU
C. aricense2	M	I	4 km W. of Mamiña	-20.06371	-69.23058	2683	21.iv	10.v.2012	L. Packer	PCYU
C. aricense2	M	I	4 km W. of Mamiña	-20.06371	-69.23058	2683	21.iv	10.v.2012	L. Packer	PCYU
C. aricense2	M	I	4km W. of Mamiña	-20.06371	-69.23058	2683	21.iv	10.v.2012	L. Packer	PCYU
C. aricense2	M	I	4km W. of Mamiña	-20.06371	-69.23058	2683	21.iv	10.v.2012	L. Packer	PCYU
C. aricense2	M	I	4km W. of Mamiña	-20.06371	-69.23058	2683	21.iv	10.v.2012	L. Packer	PCYU
C. aricense2	F	I	4 km W. of Mamiña	-20.06371	-69.23058	2683	16.iv	21.v.2012	L. Packer	PCYU
C. aricense2	F	I	4 km W. of Mamiña	-20.06371	-69.23058	2683	16.iv	21.v.2012	L. Packer	PCYU
C. aricense2	F	I	4 km W. of Mamiña	-20.06371	-69.23058	2683	16.iv	21.v.2012	L. Packer	PCYU
C. aricense2	F	I	4 km W. of Mamiña	-20.06371	-69.23058	2683	16.iv	21.v.2012	L. Packer	PCYU
C. aricense2	F	I	4 km W. of Mamiña	-20.06371	-69.23058	2683	16.iv	21.v.2012	L. Packer	PCYU
C. aricense2	F	I	4 km W. of Mamiña	-20.06371	-69.23058	2683	16.iv	21.v.2012	L. Packer	PCYU
C. aricense2	M	I	4 km W. of Mamiña	-20.06371	-69.23058	2683	16.iv	21.v.2012	L. Packer	PCYU
C. aricense2	M	I	4 km W. of Mamiña	-20.06371	-69.23058	2683	16.iv	21.v.2012	L. Packer	PCYU
C. aricense2	M	I	4 km W. of Mamiña	-20.06371	-69.23058	2683	16.iv	21.v.2012	L. Packer	PCYU
C. aricense2	M	I	4 km W. of Mamiña	-20.06371	-69.23058	2683	16.iv	21.v.2012	L. Packer	PCYU
C. aricense2	M	I	4 km W. of Mamiña	-20.06371	-69.23058	2683	16.iv	21.v.2012	L. Packer	PCYU
C. aricense2	M	I	4 km W. of Mamiña	-20.06371	-69.23058	2683	16.iv	21.v.2012	L. Packer	PCYU
C. aricense2	M	I	4 km W. of Mamiña	-20.06371	-69.23058	2683	16.iv	21.v.2012	L. Packer	PCYU
C. aricense2	M	I	4 km W. of Mamiña	-20.06371	-69.23058	2683	16.iv	21.v.2012	L. Packer	PCYU
C. aricense2	M	I	4 km W. of Mamiña	-20.06371	-69.23058	2683	16.iv	21.v.2012	L. Packer	PCYU
C. aricense2	M	I	4 km W. of Mamiña	-20.06371	-69.23058	2683	16.iv	21.v.2012	L. Packer	PCYU
C. aricense2	M	I	4 km W. of Mamiña	-20.06371	-69.23058	2683	16.iv	21.v.2012	L. Packer	PCYU
C. aricense2	M	I	4 km W. of Mamiña	-20.06371	-69.23058	2683	16.iv	21.v.2012	L. Packer	PCYU
C. aricense2	M	I	4 km W. of Mamiña	-20.06371	-69.23058	2683	16.iv	21.v.2012	L. Packer	PCYU
C. aricense2	M	I	4 km W. of Mamiña	-20.06371	-69.23058	2683	16.iv	21.v.2012	L. Packer	PCYU
C. aricense2	M	I	4 km W. of Mamiña	-20.06371	-69.23058	2683	16.iv	21.v.2012	L. Packer	PCYU

C. aricense2	M	I	4 km W. of Mamiña	-20.06371	-69.23058	2683	16.iv	21.v.2012	L. Packer		PCYU
C. aricense2	M	I	4 km W. of Mamiña	-20.06371	-69.23058	2683	16.iv	21.v.2012	L. Packer		PCYU
C. aricense2	M	I	4 km W. of Mamiña	-20.06371	-69.23058	2683	16.iv	21.v.2012	L. Packer		PCYU
C. aricense2	M	I	4 km W. of Mamiña	-20.06371	-69.23058	2683	16.iv	21.v.2012	L. Packer		PCYU
C. aricense2	M	I	4 km W. of Mamiña	-20.06371	-69.23058	2683	16.iv	21.v.2012	L. Packer		PCYU
C. aricense2	M	I	4 km W. of Mamiña	-20.06371	-69.23058	2683	16.iv	21.v.2012	L. Packer		PCYU
C. aricense2	F	I	Mamiña	-20.06371	-69.23058	2683	21.iv	10.v.2012	L. Packer		PCYU
C. aricense2	M	I	Mamiña vertedero	-20.06175	-69.22181	2660	16.iv	21.iv.2012	L. Packer		PCYU
C. aricense2	F	I	Mamiña vertedero	-20.06175	-69.22181	2660	16.iv	21.iv.2012	L. Packer		PCYU
C. aricense2	M	I	Mamiña vertedero	-20.06175	-69.22181	2660	16.iv	21.iv.2012	L. Packer		PCYU
C. aricense2	M	I	Mamiña vertedero	-20.06175	-69.22181	2660	16.iv	21.iv.2012	L. Packer		PCYU
C. aricense2	M	I	Mamiña vertedero	-20.06175	-69.22181	2660	16.iv	21.iv.2012	L. Packer		PCYU
C. aricense2	M	I	Mamiña vertedero	-20.06175	-69.22181	2660	16.iv	21.iv.2012	L. Packer		PCYU
C. aricense2	M	I	Mamiña vertedero	-20.06175	-69.22181	2660	16.iv	21.iv.2012	L. Packer		PCYU
C. aricense2	M	I	Mamiña vertedero	-20.06175	-69.22181	2660	16.iv	21.iv.2012	L. Packer		PCYU
C. aricense2	M	I	Mamiña vertedero	-20.06175	-69.22181	2660	16.iv	21.iv.2012	L. Packer		PCYU
C. aricense2	F	I	Mamiña vertedero	-20.06175	-69.22181	2660	16.iv	21.iv.2012	L. Packer		PCYU
C. aricense2	F	I	Mamiña vertedero	-20.06175	-69.22181	2660	16.iv	21.iv.2012	L. Packer		PCYU
C. aricense2	M	I	Mamiña vertedero	-20.06175	-69.22181	2660	16.iv	21.iv.2012	L. Packer		PCYU
C. aricense2	M	I	Mamiña vertedero	-20.06175	-69.22181	2660	16.iv	21.iv.2012	L. Packer		PCYU
C. aricense2	M	I	Mamiña vertedero	-20.06175	-69.22181	2660	16.iv	21.iv.2012	L. Packer		PCYU
C. aricense2	M	I	Mamiña vertedero	-20.06175	-69.22181	2660	16.iv	21.iv.2012	L. Packer		PCYU
C. aricense2	F	I	Mamiña vertedero	-20.06175	-69.22181	2660	16.iv	21.iv.2012	L. Packer		PCYU
C. aricense2	M	I	Mamiña vertedero	-20.06175	-69.22181	2660	16.iv	21.iv.2012	L. Packer		PCYU
C. aricense2	F	I	Mamiña vertedero	-20.06175	-69.22181	2660	16.iv	21.iv.2012	L. Packer		PCYU
C. aricense2	F	I	Hwy 15-CH, km 50	-19.79962	-69.35611	2381	14.iv	24.iv.2013	J. Postlethwaite & S. Monckton	CCDB-22789 H05	PCYU
C. aricense2	M	II	Aguas Blancas S. of Toconao	-23.26700	-68.00000		1.xi.2000		L. Packer	CCDB-03756 B06	PCYU
C. aricense2	M	II	27-CH, km 13.6	-22.92132	-68.05896	2657	28.iv	2.v.2013	J. Postlethwaite & S. Monckton		PCYU
C. aricense2	M	II	Hwy 27-CH, km 19.9	-22.91061	-68.00141	3045	24.i	6.iv.2013	J. Postlethwaite & S. Monckton		PCYU
C. aricense2	M	II	Llanos de la Paciencia	-22.87503	-68.30177	2386	12.iv	21.iv.2012	L. Packer		PCYU
C. aricense2	M	II	Llanos de la Paciencia	-22.87503	-68.30177	2386	12.iv	21.iv.2012	L. Packer		PCYU
C. aricense2	M	II	Llanos de la Paciencia	-22.87503	-68.30177	2386	12.iv	21.iv.2012	L. Packer		PCYU
C. aricense2	M	II	Llanos de la Paciencia	-22.87503	-68.30177	2386	12.iv	21.iv.2012	L. Packer		PCYU
C. aricense2	M	II	N. of SP de Atacama, B245 km 12	-22.82718	-68.12890	2801	21.xi	6.xii.2013	J. Postlethwaite & S. Monckton		PCYU
C. aricense2	M	II	W. of San Pedro, CH-23 km 75	-22.82577	-68.33860	2787	23.x	6.xii.2014	J. Postlethwaite		PCYU
C. aricense2	M	II	W. of San Pedro, CH-23 km 75	-22.82577	-68.33860	2787	23.x	6.xii.2014	J. Postlethwaite		PCYU
C. aricense2	M	II	W. of San Pedro, CH-23 km 75	-22.82577	-68.33860	2787	23.x	6.xii.2014	J. Postlethwaite		PCYU
C. aricense2	M	II	Hwy 23-CH, km 57	-22.71140	-68.42260	3384	10.ii	6.iv.2013	J. Postlethwaite & S. Monckton	CCDB-22788 G04	PCYU
C. aricense2	M	II	Hwy 23-CH, km 57	-22.71140	-68.42260	3384	10.ii	6.iv.2013	J. Postlethwaite & S. Monckton		PCYU
C. aricense2	F	II	Hwy 23-CH, km 57	-22.71140	-68.42260	3384	10.ii	6.iv.2013	J. Postlethwaite & S. Monckton		PCYU
C. aricense2	M	II	Hwy B-159, km 7.6	-22.34891	-68.34376	3025	25.x	05.xii.2013	J. Postlethwaite & S. Monckton		PCYU
C. aricense2	F	II	Hwy B-159, km 7.6	-22.34891	-68.34376	3025	25.x	5.xii	J. Postlethwaite & S. Monckton	CCDB-22789 G10	PCYU
C. aricense2	M	II	Hwy B-159, km 7.6	-22.34891	-68.34376	3025	25.x	5.xii.2013	J. Postlethwaite & S. Monckton		PCYU
C. aricense2	M	II	Hwy B-159, km 7.6	-22.34891	-68.34376	3025	25.x	5.xii.2013	J. Postlethwaite & S. Monckton		PCYU
C. aricense2	F	II	Hwy B-159, km 7.6	-22.34891	-68.34376	3025	25.x	05.xii.2013	J. Postlethwaite & S. Monckton		PCYU
C. aricense2	F	II	Hwy B-159, km 7.6	-22.34891	-68.34376	3025	25.x	05.xii.2013	J. Postlethwaite & S. Monckton		PCYU
C. aricense2	F	II	Hwy B-159, km 7.6	-22.34891	-68.34376	3025	25.x	05.xii.2013	J. Postlethwaite & S. Monckton		PCYU
C. aricense2	F	II	Hwy B-159, km 7.6	-22.34891	-68.34376	3025	25.x	05.xii.2013	J. Postlethwaite & S. Monckton		PCYU
C. aricense2	F	II	Hwy B-159, km 7	-22.34715	-68.34889	3000	21.i	2.iv.2013	J. Postlethwaite & S. Monckton	CCDB-22789 G08	PCYU

C. aricense2	M	II	Hwy B-159, km 7	-22.34715	-68.34889	3000	21.i	2.iv.2013	J. Postlethwaite & S. Monckton		PCYU
C. aricense2	M	II	Hwy B-159, km 7	-22.34715	-68.34889	3000	21.i	02.iv.2013	J. Postlethwaite & S. Monckton		PCYU
C. aricense2	F	II	Hwy B-159, km 7	-22.34715	-68.34889	3000	21.i	2.iv.2013	J. Postlethwaite & S. Monckton		PCYU
C. aricense2	F	II	Hwy B-159, km 7	-22.34715	-68.34889	3000	2.iv.2013	27.iv.2013	J. Postlethwaite & S. Monckton		PCYU
C. aricense2	F	II	Hwy B-159, km 7	-22.34715	-68.34889	3000	2.iv.2013	27.iv.2014	J. Postlethwaite & S. Monckton		PCYU
C. aricense2	F	II	Hwy B-159, km 7	-22.34715	-68.34889	3000	2.iv.2013	27.iv.2015	J. Postlethwaite & S. Monckton		PCYU
C. aricense2	M	II	Hwy CH-11, marker 7552332	-18.44258	-69.75993	2519	28.iv	3.v.2013	J. Postlethwaite & S. Monckton	CCDB-22789 H09	PCYU
C. aricense2	M	II	Hwy CH-11, marker 7552332	-18.44258	-69.75993	2519	28.iv	03.v.2013	J. Postlethwaite & S. Monckton		PCYU
C. aricense2	M	XV	Hwy A-31, marker 56.400	-18.74579	-69.77837	2011	31.i	17.iv.2013	J. Postlethwaite & S. Monckton		PCYU
C. aricense2	M	XV	Hwy A-31, marker 56.400	-18.74579	-69.77837	2011	31.i	17.iv.2013	J. Postlethwaite & S. Monckton		PCYU
C. aricense2	F	XV	Hwy A-31, marker 56.400	-18.74579	-69.77837	2011	31.i	17.iv.2014	J. Postlethwaite & S. Monckton	CCDB-22788 G01	PCYU
C. aricense2	M	XV	Hwy A-31, marker 56.400	-18.74579	-69.77837	2011	31.i	17.iv.2013	J. Postlethwaite & S. Monckton		PCYU
C. aricense2	M	XV	Hwy A-31, marker 56.400	-18.74579	-69.77837	2011	31.i	17.iv.2013	J. Postlethwaite & S. Monckton		PCYU
C. aricense2	F	XV	Hwy A-31, marker 56.400	-18.74579	-69.77837	2011	31.i	17.iv.2013	J. Postlethwaite & S. Monckton		PCYU
C. aricense2	F	XV	Hwy A-31, marker 56.400	-18.74579	-69.77837	2011	31.i	17.iv.2013	J. Postlethwaite & S. Monckton		PCYU
C. aricense2	F	XV	Hwy A-31, marker 56.400	-18.74579	-69.77837	2011	31.i	17.iv.2013	J. Postlethwaite & S. Monckton		PCYU
C. aricense2	M	XV	Hwy A-31, marker 56.400	-18.74579	-69.77837	2011	31.i	17.iv.2013	J. Postlethwaite & S. Monckton		PCYU
C. aricense2	M	XV	Hwy 31 55km, Pampa de Chaca	-18.74308	-69.76807	2081	20.iv.2012		L. Packer		PCYU
C. aricense2	M	XV	Hwy 31 55km, Pampa de Chaca	-18.74308	-69.76807	2018	20.iv.2012		L. Packer		PCYU
C. aricense2	M	XV	Hwy 31 55km, Pampa de Chaca	-18.74308	-69.76807	2081	20.iv.2012		L. Packer		PCYU
C. aricense2	M	XV	Hwy 31 55km, Pampa de Chaca	-18.74308	-69.76807	2081	20.iv.2012		L. Packer		PCYU
C. aricense2	M	XV	Hwy 31 59km, Pampa de Chaca	-18.73617	-69.75206	2175	20.iv.2012		L. Packer		PCYU
C. aricense2	M	XV	Hwy 31 59km, Pampa de Chaca	-18.73617	-69.75206	2175	20.iv.2012		L. Packer		PCYU
C. aricense2	F	XV	Hwy 31 59km, Pampa de Chaca	-18.73617	-69.75206	2175	11.v.2012		L. Packer		PCYU
C. aricense2	F	XV	Hwy 31 59km, Pampa de Chaca	-18.73617	-69.75206	2175	11.v.2012		L. Packer		PCYU
C. aricense2	F	XV	Hwy A-31, Chapiquiña turnoff	-18.72685	-69.70205	2497	31.i	17.iv.2013	J. Postlethwaite & S. Monckton	CCDB-22789 H01	PCYU
C. aricense2	F	XV	Hwy 11, 65km	-18.47355	-69.84498	1935	19.iv	12.v.2012	L. Packer		PCYU
C. aricense2	M	XV	Quebrada Cardones	-18.46403	-69.80427	2189	17.iv	12.v.2012	L. Packer		PCYU
C. aricense2	F	XV	Quebrada Cardones	-18.46403	-69.80427	2189	17.iv	12.v.2012	L. Packer		PCYU
C. aricense2	M	XV	Hwy 11 57km mkr	-18.44194	-69.89268	1660	17.iv	20.iv.2012	L. Packer		PCYU
C. aricense2	F	XV	Hwy 11 57km mkr	-18.44193	-69.89268	1660	17.iv	20.iv.2012	L. Packer	CCDB-15274 C05	PCYU
C. aricense2	M	XV	Planta Quiborax	-18.43806	-69.89686		11.v.2012		L. Packer		PCYU
C. aricense2	F	XV	Planta Quiborax	-18.43806	-69.89686		11.v.2012		L. Packer		PCYU
C. aricense2	M	XV	Planta Quiborax	-18.43806	-69.89686	1620	17.iv	19.iv.2012	L. Packer		PCYU
C. aricense2	F	XV	Planta Quiborax	-18.43806	-69.89686	1620	17.iv	19.iv.2012	L. Packer		PCYU
C. aricense2	M	XV	Planta Quiborax	-18.43806	-69.89686	1620	17.iv	19.iv.2012	L. Packer		PCYU
C. aricense2	M	XV	Planta Quiborax	-18.43806	-69.89686	1620	17.iv	19.iv.2012	L. Packer		PCYU
C. aricense2	F	XV	Planta Quiborax	-18.43806	-69.89686	1620	17.iv	19.iv.2012	L. Packer		PCYU
C. aricense2	M	XV	Planta Quiborax	-18.43806	-69.89686	1620	17.iv	19.iv.2012	L. Packer		PCYU
C. aricense2	F	XV	Planta Quiborax	-18.43806	-69.89686	1620	17.iv	19.iv.2012	L. Packer		PCYU
C. aricense2	F	XV	Planta Quiborax	-18.43806	-69.89686	1620	17.iv	19.iv.2012	L. Packer		PCYU
C. aricense2	F	XV	Planta Quiborax	-18.43806	-69.89686	1620	17.iv	19.iv.2012	L. Packer		PCYU
C. aricense2	M	XV	Planta Quiborax	-18.43806	-69.89686	1620	17.iv	19.iv.2012	L. Packer		PCYU
C. aricense2	F	XV	Planta Quiborax	-18.43806	-69.89686	1620	17.iv	19.iv.2012	L. Packer		PCYU
C. aricense2	F	XV	Planta Quiborax	-18.43806	-69.89686	1620	17.iv	19.iv.2012	L. Packer		PCYU
C. aricense2	M	XV	Planta Quiborax	-18.43806	-69.89686	1620	17.iv	19.iv.2012	L. Packer		PCYU
C. aricense2	M	XV	Planta Quiborax	-18.43806	-69.89686	1620	17.iv	19.iv.2012	L. Packer		PCYU
C. aricense2	M	XV	Planta Quiborax	-18.43806	-69.89686	1620	17.iv	19.iv.2012	L. Packer		PCYU
C. aricense2	M	XV	Planta Quiborax	-18.43806	-69.89686	1620	17.iv	19.iv.2012	L. Packer		PCYU

C. aricense2	M	XV	Hwy 31 55.6km, Pampa de Chaca	-18.43806	-69.78452	2989	20.iv.2012		L. Packer		PCYU
C. aricense2	M	XV	Planta Quiborax	-18.43806	-69.89686		11.v.2012		L. Packer		PCYU
C. aricense2	M	XV	Planta Quiborax	-18.43806	-69.89686		11.v.2012		L. Packer		PCYU
C. aricense2	M	XV	Planta Quiborax	-18.43806	-69.89686		11.v.2012		L. Packer		PCYU
C. aricense2	M	XV	Planta Quiborax	-18.43806	-69.89686		11.v.2012		L. Packer		PCYU
C. aricense2	F	XV	Planta Quiborax	-18.43806	-69.89686	1620	17.iv	19.iv.2012	L. Packer		PCYU
C. aricense2	F		27-CH, km 13.6	-22.92132	-68.05896	2657	28.iv	2.v.2013	J. Postlethwaite & S. Monckton		PCYU
C. atacamense	M	II	Rt. 1, 15 km N. of Taltal	-25.27824	-70.44476	16	15.x.2010		L Packer & E Almeida	CCDB-22788 G07	PCYU
C. atacamense	F	III	8 km W. of Domeyko (C-500)	-28.97934	-70.97232	659	15.x	30.xi.2014	J. Postlethwaite		PCYU
C. atacamense	M	III	8 km W. of Domeyko (C-500)	-28.97934	-70.97232	659	15.x	30.xi.2014	J. Postlethwaite		PCYU
C. atacamense	M	III	8 km W. of Domeyko (C-500)	-28.97934	-70.97232	659	15.x	30.xi.2014	J. Postlethwaite		PCYU
C. atacamense	M	III	8 km W. of Domeyko (C-500)	-28.97934	-70.97232	659	15.x	30.xi.2014	J. Postlethwaite		PCYU
C. atacamense	M	III	2 km W. of Domeyko (C-500)	-28.96536	-70.91647	759	15.x	30.xi.2014	J. Postlethwaite		PCYU
C. atacamense	M	III	2 km W. of Domeyko (C-500)	-28.96536	-70.91647	759	15.x	30.xi.2014	J. Postlethwaite		PCYU
C. atacamense	F	III	2 km W. of Domeyko (C-500)	-28.96536	-70.91647	759	15.x	30.xi.2014	J. Postlethwaite		PCYU
C. atacamense	M	III	Chuingo	-28.82510	-70.35596	963	15.ix.2010		L. Packer	B09857-E09	PCYU
C. atacamense	M	III	N. of Vallenar	-28.50000	-70.70000		x.2000		L. Packer	3259-DIAL-A07	PCYU
C. atacamense	F	III	10km N. of Vallenar	-28.46000	-70.73000		18.x.2000		L. Packer		PCYU
C. atacamense	M	III	Rd. N. of Huasco	-28.44019	-71.18803	26	1.x	14.x.2013	J. Postlethwaite & S. Monckton		PCYU
C. atacamense	M	III	Rd. N. of Huasco	-28.44019	-71.18803	26	1.x	14.x.2013	J. Postlethwaite & S. Monckton		PCYU
C. atacamense	M	III	Rd. N. of Huasco	-28.44019	-71.18803	26	14.x	7.xi.2013	J. Postlethwaite & S. Monckton	CCDB-22789 G02	PCYU
C. atacamense	M	III	Rd. N of Huasco, km 11	-28.38215	-71.16250	86	19.x	7.xi.2013	J. Postlethwaite & S. Monckton	CCDB-22789 H07	PCYU
C. atacamense	M	III	Rd. N of Huasco, km 52	-28.04383	-71.12875	65	14.x	7.xi.2013	J. Postlethwaite & S. Monckton		PCYU
C. atacamense	M	III	60 km N. of Vallenar	-28.01883	-70.55381	488	22.x	25.x.2010	L. Packer		PCYU
C. atacamense	M	III	60 km N. of Vallenar	-28.01883	-70.55381	488	22.x	25.x.2010	L. Packer		PCYU
C. atacamense	M	III	60 km N. of Vallenar	-28.01883	-70.55381	488	22.x	25.x.2010	L. Packer		PCYU
C. atacamense	M	III	60 km N. of Vallenar	-28.01883	-70.55381	488	22.x	25.x.2010	L. Packer		PCYU
C. atacamense	M	III	60 km N. of Vallenar	-28.01883	-70.55381	488	22.x	25.x.2010	L. Packer		PCYU
C. atacamense	M	III	60 km N. of Vallenar	-28.01883	-70.55381	488	22.x	25.x.2010	L. Packer		PCYU
C. atacamense	M	III	60 km N. of Vallenar	-28.01883	-70.55381	488	22.x	25.x.2010	L. Packer		PCYU
C. atacamense	M	III	60 km N. of Vallenar	-28.01883	-70.55381	488	22.x	25.x.2010	L. Packer		PCYU
C. atacamense	M	III	60 km N. of Vallenar	-28.01883	-70.55381	488	22.x	25.x.2010	L. Packer		PCYU
C. atacamense	M	III	60 km N. of Vallenar	-28.01883	-70.55381	488	22.x	25.x.2010	L. Packer		PCYU
C. atacamense	F	III	60 km N. of Vallenar	-28.01883	-70.55381	488	22.x	25.x.2010	L. Packer		PCYU
C. atacamense	F	III	60 km N. of Vallenar	-28.01883	-70.55381	488	22.x	25.x.2010	L. Packer		PCYU
C. atacamense	M	III	60 km N. of Vallenar	-28.01883	-70.55381	488	22.x	25.x.2010	L. Packer		PCYU
C. atacamense	M	III	Caldera	-27.05709	-70.80511	16	17.x	30.xi.2014	J. Postlethwaite		PCYU
C. atacamense	M	III	Caldera	-27.05709	-70.80511	16	17.x	30.xi.2014	J. Postlethwaite		PCYU
C. atacamense	M	III	Caldera	-27.05709	-70.80511	16	17.x	30.xi.2014	J. Postlethwaite		PCYU
C. atacamense	M	III	Caldera	-27.05709	-70.80511	16	17.x	30.xi.2014	J. Postlethwaite		PCYU
C. atacamense	M	III	Caldera	-27.05709	-70.80511	16	17.x	30.xi.2014	J. Postlethwaite		PCYU
C. atacamense	M	III	Caldera	-27.05709	-70.80511	16	17.x	30.xi.2014	J. Postlethwaite		PCYU
C. atacamense	F	III	Caldera	-27.05709	-70.80511	16	17.x	30.xi.2014	J. Postlethwaite		PCYU
C. atacamense	F	III	Caldera	-27.05709	-70.80511	16	17.x	30.xi.2014	J. Postlethwaite		PCYU
C. atacamense	F	III	Caldera	-27.05709	-70.80511	16	17.x	30.xi.2014	J. Postlethwaite		PCYU
C. atacamense	F	III	Caldera	-27.05709	-70.80511	16	17.x	30.xi.2014	J. Postlethwaite		PCYU
C. atacamense	F	III	Caldera	-27.05709	-70.80511	16	17.x	30.xi.2014	J. Postlethwaite		PCYU
C. atacamense	F	III	Caldera	-27.05709	-70.80511	16	17.x	30.xi.2014	J. Postlethwaite		PCYU
C. chilense	F	RM	Cerro El Roble peak	-32.97661	-71.01325	2205	1.i.2009		L. Packer	B09857-F06	PCYU

C. chilense	F	VII	NW of Laguna del Maule	-35.90200	-70.64300	1359	6.i.2013		L. Packer & R. Smith		PCYU
C. coquimbense	M	III	Caleta Carrizalillo	-29.10981	-71.46130	11	13.x	8.xi.2013	J. Postlethwaite & S. Monckton		PCYU
C. coquimbense	M	III	Caleta Carrizalillo	-29.10981	-71.46130	11	13.x	8.xi.2013	J. Postlethwaite & S. Monckton		PCYU
C. coquimbense	F	III	Caleta Carrizalillo	-29.10981	-71.46130	11	13.x	8.xi.2013	J. Postlethwaite & S. Monckton	CCDB-22789 H02	PCYU
C. coquimbense	M	III	E of Carrizalillo, C-500, km 53.3	-28.99822	-71.37874	208	8.xi	13.xii.2013	J. Postlethwaite & S. Monckton		PCYU
C. coquimbense	F	III	E of Carrizalillo, C-500, km 53.3	-28.99822	-71.37874	208	8.xi	13.xii.2013	J. Postlethwaite & S. Monckton		PCYU
C. coquimbense	F	III	E of Carrizalillo, C-500, km 53.3	-28.99822	-71.37874	208	8.xi	13.xii.2013	J. Postlethwaite & S. Monckton	CCDB-22788 G06	PCYU
C. coquimbense	M	III	2 km W. of Domeyko (C-500)	-28.96536	-70.91647	759	15.x	30.xi.2014	J. Postlethwaite		PCYU
C. coquimbense	M	III	2 km W. of Domeyko (C-500)	-28.96536	-70.91647	759	15.x	30.xi.2014	J. Postlethwaite		PCYU
C. coquimbense	M	III	2 km W. of Domeyko (C-500)	-28.96536	-70.91647	759	15.x	30.xi.2014	J. Postlethwaite		PCYU
C. coquimbense	M	III	2 km W. of Domeyko (C-500)	-28.96536	-70.91647	759	15.x	30.xi.2014	J. Postlethwaite		PCYU
C. coquimbense	M	III	2 km W. of Domeyko (C-500)	-28.96536	-70.91647	759	15.x	30.xi.2014	J. Postlethwaite		PCYU
C. coquimbense	M	III	2 km W. of Domeyko (C-500)	-28.96536	-70.91647	759	15.x	30.xi.2014	J. Postlethwaite		PCYU
C. coquimbense	M	III	2 km W. of Domeyko (C-500)	-28.96536	-70.91647	759	15.x	30.xi.2014	J. Postlethwaite		PCYU
C. coquimbense	F	III	2 km W. of Domeyko (C-500)	-28.96536	-70.91647	759	15.x	30.xi.2014	J. Postlethwaite		PCYU
C. coquimbense	F	III	2 km W. of Domeyko (C-500)	-28.96536	-70.91647	759	15.x	30.xi.2014	J. Postlethwaite		PCYU
C. coquimbense	F	III	2 km W. of Domeyko (C-500)	-28.96536	-70.91647	759	15.x	30.xi.2014	J. Postlethwaite		PCYU
C. coquimbense	F	III	2 km W. of Domeyko (C-500)	-28.96536	-70.91647	759	15.x	30.xi.2014	J. Postlethwaite		PCYU
C. coquimbense	F	III	2 km W. of Domeyko (C-500)	-28.96536	-70.91647	759	15.x	30.xi.2014	J. Postlethwaite		PCYU
C. coquimbense	F	III	2 km W. of Domeyko (C-500)	-28.96536	-70.91647	759	15.x	30.xi.2014	J. Postlethwaite		PCYU
C. coquimbense	M	III	W of Domeyko, >2km	-28.96477	-70.91582	740	2.x	15.x.2013	J. Postlethwaite & S. Monckton	CCDB-22788 G05	PCYU
C. coquimbense	M	III	W of Domeyko, >2km	-28.96477	-70.91582	740	2.x	15.x.2013	J. Postlethwaite & S. Monckton		PCYU
C. coquimbense	M	III	Rd. to Juntas de Valeriano, km 60.5	-28.93413	-70.08402	1644	15.x	7.xi.2013	J. Postlethwaite & S. Monckton	CCDB-22789 G05	PCYU
C. coquimbense	F	III	Rd. N. of Huasco	-28.44019	-71.18803	26	1.x	14.x.2013	J. Postlethwaite & S. Monckton		PCYU
C. coquimbense	M	III	Rd. N. of Huasco	-28.44019	-71.18803	26	1.x	14.x.2013	J. Postlethwaite & S. Monckton		PCYU
C. coquimbense	M	III	Rd. N. of Huasco	-28.44019	-71.18803	26	1.x	14.x.2013	J. Postlethwaite & S. Monckton		PCYU
C. coquimbense	M	III	N. Of Huasco, km 6	-28.43612	-71.18459	87	14.x	7.xi.2013	J. Postlethwaite & S. Monckton		PCYU
C. coquimbense	M	III	Rd. N of Huasco, km 18	-28.32476	-71.15281	62	14.x	17.xi.2013	J. Postlethwaite & S. Monckton	CCDB-22789 H04	PCYU
C. coquimbense	F	III	Rd. N of Huasco, km 39	-28.14721	-71.15618	37	14.x	7.xi.2013	J. Postlethwaite & S. Monckton		PCYU
C. coquimbense	F	III	Rd. N of Huasco, km 52	-28.04383	-71.12875	65	14.x	7.xi.2013	J. Postlethwaite & S. Monckton		PCYU
C. coquimbense	M	III	60 km N. of Vallenar	-28.01883	-70.55381	488	22.x	25.x.2010	L. Packer		PCYU
C. coquimbense	F	III	Rd. N of Huasco, km 67.2	-27.92718	-71.08508	169	14.x	7.xi.2013	J. Postlethwaite & S. Monckton		PCYU
C. coquimbense	M	III	Rd. N of Huasco, km 72	-27.88955	-71.08239	216	14.x	7.xi.2013	J. Postlethwaite & S. Monckton		PCYU
C. coquimbense	F	III	Quebrada Salada, Ruta 5, km 922.2	-26.73038	-70.73627	0	15xi	10.xii.2013	J. Postlethwaite & S. Monckton		PCYU
C. coquimbense	F	IV	Rd. to Los Choros	-29.34297	-71.15532	232	8.xi	13.xii.2013	J. Postlethwaite & S. Monckton		PCYU
C. coquimbense	M	IV	N of Punta de Choros, km 2.5	-29.22087	-71.46234	24	8.xi	13.xii.2013	J. Postlethwaite & S. Monckton		PCYU

Table S7: *Caenohalictus* examined for biogeographic analysis.

Species	Sex	Region	Locality	Lat.	Long	Elev. (m)	Date 1	Date 2	Collector(s)	Barcode #	Collection
C. cuprellus	M	I	SE of Mamiña A-629	-20.07805	-69.18227	2862	6.iv	26.iv.2013	J. Postlethwaite & S. Monckton		PCYU
C. cuprellus	M	I	Hwy A-65, Mamiña	-20.06972	-69.21962	2698	5.ii	6.iv.2013	J. Postlethwaite & S. Monckton		PCYU
C. cuprellus	M	I	Hwy A-65, Mamiña	-20.06972	-69.21962	2698	5.ii	6.iv.2013	J. Postlethwaite & S. Monckton		PCYU

C. cuprellus	M	I	Usmagama near Chusmiza	-19.75000	-69.22000		11.iv.2004		L. Packer		PCYU
C. cuprellus	M	I	Usmagama near Chusmiza	-19.75000	-69.22000		11.iv.2004		L. Packer	B09997-B3	PCYU
C. cuprellus	F	I	Chusmiza	-19.69000	-69.19000		30.x.2000		L. Packer		PCYU
C. cuprellus	F	I	Chusmiza	-19.69000	-69.19000		10.iv.2004		L. Packer	B09997-A12	PCYU
C. cuprellus	F	I	Chusmiza	-19.69000	-69.19000		30.x.2000		L. Packer		PCYU
C. cuprellus	M	I	Chusmiza	-19.69000	-69.19000		10.iv.2004		L. Packer	B09997-B1	PCYU
C. cuprellus	M	I	Chusmiza	-19.68293	-69.18895	3390	26.xi.2013		J. Postlethwaite & S. Monckton		PCYU
C. cuprellus	M	I	Chusmiza	-19.68293	-69.18895	3390	26.xi.2013		J. Postlethwaite & S. Monckton		PCYU
C. cuprellus	M	I	Chusmiza	-19.68293	-69.18895	3390	26.xi.2013		J. Postlethwaite & S. Monckton		PCYU
C. cuprellus	M	I	Chusmiza	-19.68293	-69.18895	3390	26.xi.2013		J. Postlethwaite & S. Monckton		PCYU
C. cuprellus	M	I	15-CH, km 81	-19.65574	-69.13376	3817	30.x.2013		S. Monckton		PCYU
C. cuprellus	F	I	15-CH, km81	-19.65574	-69.13376	3817	30.x.2013		S. Monckton	CCDB-28237 G04	PCYU
C. cuprellus	M	II	Talabre Viejo	-23.32700	-67.81900		24.xi.2002		J. Grixti & A. Zayed		PCYU
C. cuprellus	M	II	27-CH, km 17	-22.91357	-68.02657	2885	26.x.2013		S. Monckton		PCYU
C. cuprellus	M	II	27-CH, km 17	-22.91357	-68.02657	2885	26.x.2013		S. Monckton		PCYU
C. cuprellus	M	II	27-CH, km 17	-22.91357	-68.02657	2885	26.x.2013		S. Monckton		PCYU
C. cuprellus	M	II	27-CH, km 17	-22.91357	-68.02657	2885	26.x.2013		S. Monckton		PCYU
C. cuprellus	M	II	27-CH, km 17	-22.91357	-68.02657	2885	26.x.2013		S. Monckton		PCYU
C. cuprellus	M	II	27-CH, km 17	-22.91357	-68.02657	2885	26.x.2013		S. Monckton		PCYU
C. cuprellus	M	II	27-CH, km 17	-22.91357	-68.02657	2885	26.x.2013		S. Monckton		PCYU
C. cuprellus	M	II	Hwy 27-CH, km 25.6	-22.91088	-67.94342	3473	28.iv	2.v.2013	J. Postlethwaite & S. Monckton		PCYU
C. cuprellus	M	II	Hwy 27-CH, km 25.6	-22.91088	-67.94342	3473	24.i	6.iv.2013	J. Postlethwaite & S. Monckton		PCYU
C. cuprellus	F	II	Hwy 27-CH, km 25.6	-22.91088	-67.94342	3473	28.iv	2.v.2013	J. Postlethwaite & S. Monckton	CCDB-22014 D03	PCYU
C. cuprellus	F	II	Hwy 27-CH, km 25.6	-22.91088	-67.94342	3473	6.iv	28.iv.2013	J. Postlethwaite & S. Monckton		PCYU
C. cuprellus	F	II	Hwy 27-CH, km 25.6	-22.91088	-67.94342	3473	6.iv	28.iv.2013	J. Postlethwaite & S. Monckton	CCDB-28231 G03	PCYU
C. cuprellus	F	II	Hwy 27-CH, km 25.6	-22.91088	-67.94342	3473	28.iv	2.v.2013	J. Postlethwaite & S. Monckton		PCYU
C. cuprellus	M	II	Rd. to Machuca, km 5.4	-22.72462	-68.05420	3506	27.x.2013		S. Monckton		PCYU
C. cuprellus	M	II	Rd. to Machuca, km 5.4	-22.72462	-68.05420	3506	27.x.2013		S. Monckton		PCYU
C. cuprellus	M	II	Rd. to Machuca, km 5.4	-22.72462	-68.05420	3506	27.x.2013		S. Monckton		PCYU
C. cuprellus	M	II	Rd. to Machuca, km 5.4	-22.72462	-68.05420	3506	27.x.2013		S. Monckton		PCYU
C. cuprellus	M	II	Rd. to Machuca, km 5.4	-22.72462	-68.05420	3506	27.x.2013		S. Monckton		PCYU
C. cuprellus	M	II	Rd. to Machuca, km 5.4	-22.72462	-68.05420	3506	27.x.2013		S. Monckton		PCYU
C. cuprellus	M	II	Rd. to Machuca, km 5.4	-22.72462	-68.05420	3506	27.x.2013		S. Monckton		PCYU
C. cuprellus	F	II	Rd. to Machuca, km 5.4	-22.72462	-68.05420	3506	27.x.2013		S. Monckton	CCDB-22015 H09	PCYU
C. cuprellus	F	II	N. of Puritama	-22.71397	-68.02596	3738	19.ix	27.x.2013	J. Postlethwaite & S. Monckton		PCYU
C. cuprellus	F	II	N. of Puritama	-22.71397	-68.02596	3738	19.ix	27.x.2013	J. Postlethwaite & S. Monckton		PCYU
C. cuprellus	F	II	N. of Puritama	-22.71397	-68.02596	3738	19.ix	27.x.2013	J. Postlethwaite & S. Monckton		PCYU
C. cuprellus	F	II	N. of Puritama	-22.71397	-68.02596	3738	6.xii.2013		J Postlethwaite		PCYU
C. cuprellus	F	II	N. of Puritama	-22.71397	-68.02596	3738	6.xii.2013		J Postlethwaite		PCYU
C. cuprellus	M	II	B-245, km 19.5	-22.71397	-68.02596	3738	27.x.2013		S. Monckton		PCYU
C. cuprellus	M	II	Hwy B-159, km 26	-22.40124	-68.20705	3501	3.iv	27.iv.2013	J. Postlethwaite & S. Monckton		PCYU
C. cuprellus	M	XV	E. of La Noria, S. of Pozo Almonte	-20.41544	-69.80620	1128	28.xi.2013		J. Postlethwaite & S. Monckton		PCYU
C. cuprellus	M	XV	E. of La Noria, S. of Pozo Almonte	-20.41544	-69.80620	1128	28.xi.2013		J. Postlethwaite & S. Monckton		PCYU
C. cuprellus	M	XV	E. of La Noria, S. of Pozo Almonte	-20.41544	-69.80620	1128	28.xi.2013		J. Postlethwaite & S. Monckton		PCYU
C. cuprellus	M	XV	E. of La Noria, S. of Pozo Almonte	-20.41544	-69.80620	1128	28.xi.2013		J. Postlethwaite & S. Monckton		PCYU
C. cuprellus	F	XV	Hwy A-31, SW of Tignamar	-18.69879	-69.60845	3047	31.i	18.iv.2013	J. Postlethwaite & S. Monckton	CCDB-28231 G01	PCYU
C. cuprellus	M	XV	Hwy A-31, km 91	-18.65745	-69.53724	3447	24.ix	31.x.2013	J. Postlethwaite & S. Monckton		PCYU
C. cuprellus	M	XV	Hwy A-31, km 91	-18.65745	-69.53724	3447	31.x	30.xi.2013	J. Postlethwaite & S. Monckton		PCYU
C. cuprellus	M	XV	S of Pucará Belén, Hwy A-31, km 132	-18.49130	-69.52111	3108	28.xi.2013		J. Postlethwaite & S. Monckton		PCYU

C. cuprellus	M	XV	S of Pucará Belén, Hwy A-31, km 132	-18.49130	-69.52111	3108	28.xi.2013	J. Postlethwaite & S. Monckton		PCYU
C. cuprellus	M	XV	Hwy A-31, N. of Lupica	-18.48591	-69.52705	3132	1.ii.2013	J Postlethwaite		PCYU
C. cuprellus	M	XV	Tojo Tojone	-18.48553	-69.52830	3151	28.xi.2014	J Postlethwaite		PCYU
C. cuprellus	M	XV	Tojo Tojone	-18.48553	-69.52830	3151	28.xi.2014	J Postlethwaite		PCYU
C. cuprellus	M	XV	Tojo Tojone	-18.48553	-69.52830	3151	28.xi.2014	J Postlethwaite		PCYU
C. cuprellus	M	XV	Tojo Tojone	-18.48553	-69.52830	3151	28.xi.2014	J Postlethwaite		PCYU
C. cuprellus	M	XV	Pucará Belén, Hwy A-31	-18.47290	-69.52797	3129	1.xi.2013	S. Monckton		PCYU
C. cuprellus	M	XV	Pucará Belén, Hwy A-31	-18.47290	-69.52797	3129	1.xi.2013	S. Monckton		PCYU
C. cuprellus	M	XV	Pucará Belén, Hwy A-31	-18.47290	-69.52797	3129	1.xi.2013	S. Monckton		PCYU
C. cuprellus	M	XV	Pucará Belén, Hwy A-31	-18.47290	-69.52797	3129	1.xi.2013	S. Monckton		PCYU
C. cuprellus	M	XV	Pucará Belén, Hwy A-31	-18.47290	-69.52797	3129	1.xi.2013	S. Monckton		PCYU
C. cuprellus	M	XV	NW of Belén	-18.45234	-69.51498	3328	28.xi.2013	J. Postlethwaite & S. Monckton		PCYU
C. cuprellus	M	XV	NW of Belén	-18.45234	-69.51498	3328	28.xi.2013	J. Postlethwaite & S. Monckton		PCYU
C. cuprellus	M	XV	NW of Belén	-18.45234	-69.51498	3328	28.xi.2013	J. Postlethwaite & S. Monckton		PCYU
C. cuprellus	M	XV	NW of Belén	-18.45234	-69.51498	3328	28.xi.2013	J. Postlethwaite & S. Monckton		PCYU
C. cuprellus	M	XV	NW of Belén	-18.45234	-69.51498	3328	28.xi.2013	J. Postlethwaite & S. Monckton		PCYU
C. cuprellus	M	XV	NW of Belén	-18.45234	-69.51498	3328	28.xi.2013	J. Postlethwaite & S. Monckton		PCYU
C. cuprellus	M	XV	NW of Belén	-18.45234	-69.51498	3328	28.xi.2013	J. Postlethwaite & S. Monckton		PCYU
C. cuprellus	M	XV	NW of Belén	-18.45234	-69.51498	3328	28.xi.2013	J. Postlethwaite & S. Monckton		PCYU
C. cuprellus	M	XV	NW of Belén	-18.45234	-69.51498	3328	28.xi.2013	J. Postlethwaite & S. Monckton		PCYU
C. cuprellus	M	XV	NW of Belén	-18.45234	-69.51498	3328	28.xi.2013	J. Postlethwaite & S. Monckton		PCYU
C. cuprellus	F	XV	E. of Arica, Hwy CH-11	-18.43778	-69.74077	2983	8.xii.2014	L. Packer		PCYU
C. cuprellus	M	XV	E. of Arica, Hwy CH-11	-18.43778	-69.74077	2983	8.xii.2014	L. Packer		PCYU
C. cuprellus	M	XV	E. of Arica, Hwy CH-11	-18.43778	-69.74077	2983	8.xii.2014	L. Packer		PCYU
C. cuprellus	M	XV	E. of Arica, Hwy CH-11	-18.43778	-69.74077	2983	8.xii.2014	L. Packer		PCYU
C. cuprellus	M	XV	E. of Arica, Hwy CH-11	-18.43778	-69.74077	2983	8.xii.2014	L. Packer		PCYU
C. cuprellus	M	XV	E. of Arica, Hwy CH-11	-18.43778	-69.74077	2983	8.xii.2014	L. Packer		PCYU
C. cuprellus	M	XV	E. of Arica, Hwy CH-11	-18.43778	-69.74077	2983	8.xii.2014	L. Packer		PCYU
C. cuprellus	M	XV	E. of Arica, Hwy CH-11	-18.43778	-69.74077	2983	8.xii.2014	L. Packer		PCYU
C. cuprellus	M	XV	E. of Arica, Hwy CH-11	-18.43778	-69.74077	2983	8.xii.2014	L. Packer		PCYU
C. cuprellus	M	XV	N. of Belen, Hwy A-31	-18.42251	-69.50607	3694	9.xii.2014	J. Postlethwaite & S. Monckton		PCYU
C. cuprellus	M	XV	Hwy A-31, km 164	-18.35633	-69.54819	3585	1.xi.2013	S. Monckton		PCYU
C. cuprellus	F	XV	Hwy A-31, km 164	-18.35633	-69.54819	3585	1.xi.2013	S. Monckton		PCYU
C. cuprellus	F	XV	Puente Murmuntani	-18.35000	-69.55300	3565	13.iv.2004	L. Packer		PCYU
C. cuprellus	F	XV	Puente Murmuntani	-18.35000	-69.55300	3565	13.iv.2004	L. Packer		PCYU
C. cuprellus	F	XV	Puente Murmuntani	-18.35000	-69.55300	3565	13.iv.2004	L. Packer		PCYU
C. cuprellus	F	XV	Puente Murmuntani	-18.35000	-69.55300	3565	13.iv.2004	L. Packer		PCYU
C. cuprellus	F	XV	Puente Murmuntani	-18.35000	-69.55300	3565	13.iv.2004	L. Packer		PCYU
C. cuprellus	F	XV	Puente Murmuntani	-18.35000	-69.55300	3565	13.iv.2004	L. Packer		PCYU
C. cuprellus	F	XV	Puente Murmuntani	-18.35000	-69.55300	3565	13.iv.2004	L. Packer		PCYU
C. cuprellus	F	XV	Puente Murmuntani	-18.35000	-69.55300	3565	13.iv.2004	L. Packer	CCDB-03770 H09	PCYU
C. cuprellus	M	XV	Murmuntani	-18.34999	-69.55273	3538	29.xi.2013	J. Postlethwaite & S. Monckton		PCYU
C. cuprellus	M	XV	Murmuntani	-18.34999	-69.55273	3538	29.xi.2013	J. Postlethwaite & S. Monckton		PCYU
C. cuprellus	F	XV	Murmuntani	-18.34999	-69.55273	3538	29.xi.2013	J. Postlethwaite & S. Monckton		PCYU
C. cuprellus	F	XV	Puente Murmuntani	-18.34600	-69.55200	3565	13.iv.2004	L. Packer		PCYU
C. cuprellus	F	XV	1km NW Puente Murmuntani	-18.34000	-69.56000	3520	14.iv.2004	L. Packer		PCYU
C. cuprellus	M	XV	CH-11, N of Zaphuria	-18.32212	-69.59515	3357	29.xi.2014	J Postlethwaite		PCYU
C. cuprellus	M	XV	CH-11, N of Zaphuria	-18.32212	-69.59515	3357	29.xi.2014	J Postlethwaite		PCYU
C. cuprellus	M	XV	CH-11, N of Zaphuria	-18.32212	-69.59515	3357	29.xi.2014	J Postlethwaite		PCYU

C. cuprellus	M	XV	CH-11 N. of Zapuria	-18.31501	-69.59683	3414	22.iv	29.iv.2013	J. Postlethwaite & S. Monckton		PCYU
C. cuprellus	F	XV	CH-11 N. of Zapuria	-18.31501	-69.59683	3414	22.iv	29.iv.2013	J. Postlethwaite & S. Monckton	CCDB-28231 F12	PCYU
C. cuprellus	F	XV	Tambo, 4km W. of Zapahuira	-18.30000	-69.60000		4.iv.2000		L. Packer	B10040-C6	PCYU
C. cuprellus	M	XV	Near Zapahuira	-18.30000	69.60000				L. Packer	CCDB-22014 H10	PCYU
C. cuprellus	F	XV	Mirador de Socoroma	-18.27900	-69.58400		15.xi.1997		L. Packer		PCYU
C. cuprellus	M	XV	Mirador de Socoroma	-18.27900	-69.58400		15.xi.1997		L. Packer		PCYU
C. cuprellus	F	XV	Mirador de Socoroma	-18.27900	-69.58400		15.xi.1997		L. Packer		PCYU
C. cuprellus	M	XV	Hwy 11, 11km S. of Putre	-18.27200	-69.57300	3530	14.iv.2004		L. Packer		PCYU
C. cuprellus	F	XV	Hwy 11, 11km S. of Putre	-18.27200	-69.57300	3530	14.iv.2004		L. Packer		PCYU
C. cuprellus	M	XV	Hwy 11, 11km S. of Putre	-18.27200	-69.57300	3530	14.iv.2004		L. Packer		PCYU
C. cuprellus	F	XV	CH-11 km 114.5	-18.24954	-69.56012	3501	3.ii	21.iv.2013	J. Postlethwaite & S. Monckton		PCYU
C. cuprellus	M	XV	11-CH, km 116.5	-18.24559	-69.55428	3519	3.xi.2013		S. Monckton		PCYU
C. cuprellus	F	XV	E. of Putre	-18.21000	-69.54000		14.iv.2004		L. Packer	B09997-B2	PCYU
C. cuprellus	F	XV	CH-11 N. of Putre	-18.20783	-69.53346	3809	19.iv	29.iv.2013	J. Postlethwaite & S. Monckton	CCDB-28231 G07	PCYU
C. cuprellus	M	XV	11-CH, km 130	-18.20461	-69.52948	3885	2.xi.2013		S. Monckton		PCYU
C. cuprellus	M	XV	11-CH, km 130	-18.20461	-69.52948	3885	2.xi.2013		S. Monckton		PCYU
C. cuprellus	M	XV	11-CH, km 130	-18.20461	-69.52948	3885	2.xi.2013		S. Monckton		PCYU
C. cuprellus	M	XV	11-CH, km 130	-18.20461	-69.52948	3885	2.xi.2013		S. Monckton		PCYU
C. cuprellus	M	XV	11-CH, km 130	-18.20461	-69.52948	3885	2.xi.2013		S. Monckton		PCYU
C. cuprellus	M	XV	11-CH, km 130	-18.20461	-69.52948	3885	2.xi.2013		S. Monckton		PCYU
C. cuprellus	F	XV	Termas de Jurasi	-18.20402	-69.52802	3907	19.iv	29.iv.2013	J. Postlethwaite & S. Monckton	CCDB-22014 C11	PCYU
C. cuprellus	F	XV	A-23, N. of Putre	-18.01853	-69.57982	4004	2.ii	19.iv.2013	J. Postlethwaite & S. Monckton		PCYU
C. dolator	M	I	Mamiña vertedero	-69.04198	-20.30882	2660	21.iv	10.v.2013	L. Packer		PCYU
C. dolator	M	I	Mamiña vertedero	-69.04198	-20.30882	2660	21.iv	10.v.2013	L. Packer		PCYU
C. dolator	F	I	W. of San Pedro, CH-23 km 75	-22.82577	-68.33860	2787	23.x	6.xii.2014	J Postlethwaite		PCYU
C. dolator	F	I	73km SE Pozo Almonte	-20.31233	-69.12930	3137	27.iv	2.v.2013	J. Postlethwaite & S. Monckton		PCYU
C. dolator	F	I	73km SE Pozo Almonte	-20.31233	-69.12930	3137	27.iv	2.v.2013	J. Postlethwaite & S. Monckton		PCYU
C. dolator	F	I	73km SE Pozo Almonte	-20.31233	-69.12930	3137	27.iv	2.v.2013	J. Postlethwaite & S. Monckton		PCYU
C. dolator	F	I	73km SE Pozo Almonte	-20.31233	-69.12930	3137	27.iv	2.v.2013	J. Postlethwaite & S. Monckton		PCYU
C. dolator	F	I	73km SE Pozo Almonte	-20.31233	-69.12930	3137	27.iv	2.v.2013	J. Postlethwaite & S. Monckton		PCYU
C. dolator	F	I	73km SE Pozo Almonte	-20.31233	-69.12930	3137	27.iv	2.v.2013	J. Postlethwaite & S. Monckton		PCYU
C. dolator	F	I	73km SE Pozo Almonte	-20.31233	-69.12930	3137	27.iv	2.v.2013	J. Postlethwaite & S. Monckton		PCYU
C. dolator	F	I	73km SE Pozo Almonte	-20.31233	-69.12930	3137	27.iv	2.v.2013	J. Postlethwaite & S. Monckton		PCYU
C. dolator	F	I	73km SE Pozo Almonte	-20.31233	-69.12930	3137	27.iv	2.v.2013	J. Postlethwaite & S. Monckton		PCYU
C. dolator	F	I	73km SE Pozo Almonte	-20.31233	-69.12930	3137	27.iv	2.v.2013	J. Postlethwaite & S. Monckton		PCYU
C. dolator	M	I	73km SE Pozo Almonte	-20.31233	-69.12930	3137	27.iv	2.v.2013	J. Postlethwaite & S. Monckton		PCYU
C. dolator	M	I	73km SE Pozo Almonte	-20.31233	-69.12930	3137	27.iv.2013		J. Postlethwaite & S. Monckton		PCYU
C. dolator	M	I	Hwy 687, E. of Pozo Almonte	-20.30959	-69.04293	4004	11.iv	27.iv.2013	J. Postlethwaite & S. Monckton		PCYU
C. dolator	F	I	Hwy 687, E. of Pozo Almonte	-20.30959	-69.04293	4004	11.iv	27.iv.2013	J. Postlethwaite & S. Monckton		PCYU
C. dolator	F	I	Hwy 687, E. of Pozo Almonte	-20.30959	-69.04293	4004	11.iv	27.iv.2013	J. Postlethwaite & S. Monckton		PCYU
C. dolator	F	I	Hwy 687, E. of Pozo Almonte	-20.30959	-69.04293	4004	11.iv	27.iv.2013	J. Postlethwaite & S. Monckton		PCYU
C. dolator	F	I	Hwy 687, E. of Pozo Almonte	-20.30959	-69.04293	4004	11.iv	27.iv.2013	J. Postlethwaite & S. Monckton		PCYU
C. dolator	F	I	Hwy 687, E. of Pozo Almonte	-20.30959	-69.04293	4004	11.iv	27.iv.2013	J. Postlethwaite & S. Monckton		PCYU
C. dolator	F	I	Hwy 687, E. of Pozo Almonte	-20.30959	-69.04293	4004	11.iv	27.iv.2013	J. Postlethwaite & S. Monckton		PCYU
C. dolator	F	I	Hwy 687, E. of Pozo Almonte	-20.30959	-69.04293	4004	11.iv	27.iv.2013	J. Postlethwaite & S. Monckton		PCYU
C. dolator	M	I	Hwy 687, E. of Pozo Almonte	-20.30280	-69.09479	3505	11.iv	27.iv.2013	J. Postlethwaite & S. Monckton		PCYU
C. dolator	F	I	Hwy 687, E. of Pozo Almonte	-20.30280	-69.09479	3505	11.iv	27.iv.2013	J. Postlethwaite & S. Monckton		PCYU
C. dolator	F	I	Hwy 687, E. of Pozo Almonte	-20.30280	-69.09479	3505	11.iv	27.iv.2013	J. Postlethwaite & S. Monckton		PCYU
C. dolator	F	I	Hwy 687, E. of Pozo Almonte	-20.30280	-69.09479	3505	11.iv	27.iv.2013	J. Postlethwaite & S. Monckton		PCYU

C. dolator	F	I	Hwy 687, E. of Pozo Almonte	-20.30270	-69.09481	3500	28.x	2.xii.2013	J. Postlethwaite & S. Monckton	PCYU
C. dolator	F	I	Hwy 687, E. of Pozo Almonte	-20.30270	-69.09481	3500	28.x	2.xii.2013	J. Postlethwaite & S. Monckton	PCYU
C. dolator	F	I	Hwy 687, E. of Pozo Almonte	-20.30270	-69.09481	3500	28.x	2.xii.2013	J. Postlethwaite & S. Monckton	PCYU
C. dolator	F	I	Hwy 687, E. of Pozo Almonte	-20.30270	-69.09481	3500	28.x	2.xii.2013	J. Postlethwaite & S. Monckton	PCYU
C. dolator	M	I	Hwy 687, E. of Pozo Almonte	-20.29873	-69.14114	3004	6.ii	9.iv.2013	J. Postlethwaite & S. Monckton	PCYU
C. dolator	M	I	Hwy 687, E. of Pozo Almonte	-20.29873	-69.14114	3004	6.ii	9.iv.2013	J. Postlethwaite & S. Monckton	PCYU
C. dolator	M	I	Hwy 687, E. of Pozo Almonte	-20.29873	-69.14114	3004	6.ii	9.iv.2013	J. Postlethwaite & S. Monckton	PCYU
C. dolator	M	I	Hwy 687, E. of Pozo Almonte	-20.29873	-69.14114	3004	6.ii	9.iv.2013	J. Postlethwaite & S. Monckton	PCYU
C. dolator	M	I	Hwy 687, E. of Pozo Almonte	-20.29873	-69.14114	3004	9.iv.2013	27.iv.2013	J. Postlethwaite & S. Monckton	PCYU
C. dolator	M	I	Hwy 687, E. of Pozo Almonte	-20.29873	-69.14114	3004	6.ii	9.iv.2013	J. Postlethwaite & S. Monckton	PCYU
C. dolator	F	I	Hwy 687, E. of Pozo Almonte	-20.29873	-69.14114	3004	6.ii	9.iv.2013	J. Postlethwaite & S. Monckton	PCYU
C. dolator	F	I	Hwy 687, E. of Pozo Almonte	-20.29873	-69.14114	3004	6.ii	9.iv.2013	J. Postlethwaite & S. Monckton	PCYU
C. dolator	F	I	Hwy 687, E. of Pozo Almonte	-20.29873	-69.14114	3004	6.ii	9.iv.2013	J. Postlethwaite & S. Monckton	PCYU
C. dolator	F	I	Hwy 687, E. of Pozo Almonte	-20.29873	-69.14114	3004	28.x	2.xii.2013	J. Postlethwaite & S. Monckton	PCYU
C. dolator	F	I	Hwy 687, E. of Pozo Almonte	-20.29873	-69.14114	3004	9.iv	27.iv.2013	J. Postlethwaite & S. Monckton	PCYU
C. dolator	F	I	Hwy 687, E. of Pozo Almonte	-20.29873	-69.14114	3004	6.ii	9.iv.2013	J. Postlethwaite & S. Monckton	PCYU
C. dolator	F	I	Hwy 687, E. of Pozo Almonte	-20.29873	-69.14114	3004	6.ii	9.iv.2013	J. Postlethwaite & S. Monckton	PCYU
C. dolator	F	I	Hwy 687, E. of Pozo Almonte	-20.29873	-69.14114	3004	28.x	2.xii.2013	J. Postlethwaite & S. Monckton	PCYU
C. dolator	F	I	Hwy 687, E. of Pozo Almonte	-20.29873	-69.14114	3004	6.ii	9.iv.2013	J. Postlethwaite & S. Monckton	PCYU
C. dolator	F	I	Hwy 687, E. of Pozo Almonte	-20.29873	-69.14114	3004	9.iv	27.iv.2013	J. Postlethwaite & S. Monckton	PCYU
C. dolator	F	I	Hwy 687, E. of Pozo Almonte	-20.29873	-69.14114	3004	9.iv	27.iv.2013	J. Postlethwaite & S. Monckton	PCYU
C. dolator	F	I	Hwy 687, E. of Pozo Almonte	-20.29873	-69.14114	3004	6.ii	9.iv.2013	J. Postlethwaite & S. Monckton	PCYU
C. dolator	F	I	Hwy 687, E. of Pozo Almonte	-20.29873	-69.14114	3004	9.iv	27.iv.2013	J. Postlethwaite & S. Monckton	PCYU
C. dolator	M	I	Hwy 687, E. of Pozo Almonte	-20.29873	-69.14114	3004	6.ii	9.iv.2013	J. Postlethwaite & S. Monckton	PCYU
C. dolator	M	I	Hwy 687, E. of Pozo Almonte	-20.29873	-69.14114	3004	6.ii	9.iv.2013	J. Postlethwaite & S. Monckton	PCYU
C. dolator	F	I	Hwy 687, E. of Pozo Almonte	-20.29873	-69.14114	3004	9.iv	27.iv.2013	J. Postlethwaite & S. Monckton	PCYU
C. dolator	M	I	Hwy 687, km 63	-20.28870	-69.21086	2505	6.ii	9.iv.2013	J. Postlethwaite & S. Monckton	PCYU
C. dolator	F	I	Hwy 687, km 63	-20.28870	-69.21086	2505	6.ii	9.iv.2013	J. Postlethwaite & S. Monckton	PCYU
C. dolator	F	I	Hwy 687, km 63	-20.28870	-69.21086	2505	6.ii	9.iv.2013	J. Postlethwaite & S. Monckton	PCYU
C. dolator	F	I	Hwy 687, km 63	-20.28870	-69.21086	2505	6.ii	9.iv.2013	J. Postlethwaite & S. Monckton	PCYU
C. dolator	F	I	Hwy 687, km 63	-20.28870	-69.21086	2505	6.ii	9.iv.2013	J. Postlethwaite & S. Monckton	PCYU
C. dolator	F	I	Hwy 687, km 63	-20.28870	-69.21086	2505	6.ii	9.iv.2013	J. Postlethwaite & S. Monckton	PCYU
C. dolator	F	I	Hwy 687, km 63	-20.28870	-69.21086	2505	9.iv	27.iv.2013	J. Postlethwaite & S. Monckton	PCYU
C. dolator	F	I	Hwy 687, km 63	-20.28870	-69.21086	2505	9.iv	27.iv.2013	J. Postlethwaite & S. Monckton	PCYU
C. dolator	F	I	Hwy 687, km 63	-20.28870	-69.21086	2505	9.iv	27.iv.2013	J. Postlethwaite & S. Monckton	PCYU
C. dolator	F	I	Hwy 687, km 63	-20.28870	-69.21086	2505	9.iv	27.iv.2013	J. Postlethwaite & S. Monckton	PCYU
C. dolator	F	I	Hwy 687, km 63	-20.28870	-69.21086	2505	6.ii	9.iv.2013	J. Postlethwaite & S. Monckton	PCYU
C. dolator	M	I	Hwy 687, km53	-20.27393	-69.29879	2011	23.ix	28.x.2013	J. Postlethwaite & S. Monckton	PCYU
C. dolator	F	I	Hwy 687, E. of Pozo Almonte	-20.25804	-69.40373	1507	8.iv	27.iv.2013	J. Postlethwaite & S. Monckton	PCYU
C. dolator	F	I	Hwy 687, E. of Pozo Almonte	-20.25203	-69.58144	1047	8.iv	27.iv.2013	J. Postlethwaite & S. Monckton	PCYU
C. dolator	F	I	Hwy 687, E. of Pozo Almonte	-20.25203	-69.58144	1047	8.iv	27.iv.2013	J. Postlethwaite & S. Monckton	PCYU
C. dolator	M	I	Hwy 687, E. of Pozo Almonte	-20.25203	-69.58144	1047	8.iv	27.iv.2013	J. Postlethwaite & S. Monckton	PCYU
C. dolator	M	I	Hwy 687, E. of Pozo Almonte	-20.25203	-69.58144	1047	8.iv	27.iv.2013	J. Postlethwaite & S. Monckton	PCYU
C. dolator	M	I	Hwy 687, E. of Pozo Almonte	-20.25136	-69.60275	1052	22.ix	28.x.2013	J. Postlethwaite & S. Monckton	PCYU
C. dolator	M	I	Hwy 687, E. of Pozo Almonte	-20.25136	-69.60275	1052	22.xi	28.x.2013	J. Postlethwaite & S. Monckton	PCYU
C. dolator	F	I	Hwy 687, E. of Pozo Almonte	-20.25136	-69.60275	1052	22.xi	28.x.2013	J. Postlethwaite & S. Monckton	PCYU
C. dolator	F	I	Hwy 687, E. of Pozo Almonte	-20.25136	-69.60275	1052	22.xi	28.x.2013	J. Postlethwaite & S. Monckton	PCYU
C. dolator	F	I	Hwy 687, E. of Pozo Almonte	-20.25136	-69.60275	1052	28.x.2013	2.xii.2013	J. Postlethwaite & S. Monckton	PCYU
C. dolator	F	I	Hwy 687, E. of Pozo Almonte	-20.25136	-69.60275	1052	28.x.2013	2.xii.2013	J. Postlethwaite & S. Monckton	PCYU

C. dolator	F	I	Hwy 687, E. of Pozo Almonte	-20.25136	-69.60275	1052	22.ix	28.x.2013	J. Postlethwaite & S. Monckton		PCYU
C. dolator	F	I	Hwy 687, E. of Pozo Almonte	-20.25136	-69.60275	1052	22.ix	28.x.2013	J. Postlethwaite & S. Monckton		PCYU
C. dolator	M	I	Hwy 687, E. of Pozo Almonte	-20.25114	-69.63483	1026	24.xi.2013		J. Postlethwaite & S. Monckton		PCYU
C. dolator	M	I	Hwy 687, E. of Pozo Almonte	-20.25114	-69.63483	1026	24.xi.2013		J. Postlethwaite & S. Monckton		PCYU
C. dolator	M	I	Hwy 687, E. of Pozo Almonte	-20.25114	-69.63483	1026	24.xi.2013		J. Postlethwaite & S. Monckton		PCYU
C. dolator	M	I	Hwy 687, E. of Pozo Almonte	-20.25114	-69.63483	1026	24.xi.2013		J. Postlethwaite & S. Monckton		PCYU
C. dolator	M	I	20 km E. of Pozo Almonte	-20.20000	-69.60000		17.iv.2004		L. Packer	B10040-C7	PCYU
C. dolator	M	I	20 km E. of Pozo Almonte	-20.20000	-69.60000		17.iv.2004		L. Packer		PCYU
C. dolator	F	I	Hwy A-65, km 24.8	-20.14194	-69.45021	1429	26.ix	29.x.2013	J. Postlethwaite & S. Monckton		PCYU
C. dolator	F	I	Hwy A-65, km 24.8	-20.14194	-69.45021	1429	26.ix	29.x.2013	J. Postlethwaite & S. Monckton		PCYU
C. dolator	F	I	Hwy A-65, km 24.8	-20.14194	-69.45021	1429	26.ix	29.x.2013	J. Postlethwaite & S. Monckton		PCYU
C. dolator	F	I	Hwy A-65, km 24.8	-20.14194	-69.45021	1429	26.ix	29.x.2013	J. Postlethwaite & S. Monckton		PCYU
C. dolator	F	I	W. of Mamiña, Rd. to Cerro Colorado	-20.09162	-69.29456	2332	23.x	10.xii.2014	J Postlethwaite		PCYU
C. dolator	F	I	W. of Mamiña, Rd. to Cerro Colorado	-20.09162	-69.29456	2332	23.x	10.xii.2014	J Postlethwaite		PCYU
C. dolator	F	I	W. of Mamiña, Rd. to Cerro Colorado	-20.09162	-69.29456	2332	23.x	10.xii.2014	J Postlethwaite		PCYU
C. dolator	M	I	W. of Mamiña, Rd. to Cerro Colorado	-20.09162	-69.29456	2332	23.x	10.xii.2014	J Postlethwaite		PCYU
C. dolator	M	I	W. of Mamiña, Rd. to Cerro Colorado	-20.09162	-69.29456	2332	23.x	10.xii.2014	J Postlethwaite		PCYU
C. dolator	F	I	Hwy A-65, SW of Mamiña	-20.08347	-69.36048	1972	6.iv	26.iv.2013	J. Postlethwaite & S. Monckton		PCYU
C. dolator	F	I	Hwy A-65, SW of Mamiña	-20.08347	-69.36048	1972	6.iv	26.iv.2013	J. Postlethwaite & S. Monckton		PCYU
C. dolator	M	I	Hwy A-65, SW of Mamiña	-20.08347	-69.36048	1972	6.iv	26.iv.2013	J. Postlethwaite & S. Monckton		PCYU
C. dolator	M	I	Hwy A-65, SW of Mamiña	-20.08347	-69.36048	1972	6.iv	26.iv.2013	J. Postlethwaite & S. Monckton		PCYU
C. dolator	M	I	S. of Mamiña A-65	-20.08317	-69.27347	2367	10.iv	26.iv.2013	J. Postlethwaite & S. Monckton		PCYU
C. dolator	F	I	S. of Mamiña A-65	-20.08317	-69.27347	2367	10.iv	26.iv.2013	J. Postlethwaite & S. Monckton		PCYU
C. dolator	F	I	W. of Mamiña, Quebrada Guataguata	-20.08222	-69.36446	1978	24.xi	3.xii.2013	J. Postlethwaite & S. Monckton		PCYU
C. dolator	F	I	W. of Mamiña, Quebrada Guataguata	-20.08222	-69.36446	1978	24.xi	3.xii.2013	J. Postlethwaite & S. Monckton		PCYU
C. dolator	F	I	SE of Mamiña A-629	-20.07805	-69.18227	2862	6.iv	26.iv.2013	J. Postlethwaite & S. Monckton		PCYU
C. dolator	F	I	SE of Mamiña A-629	-20.07805	-69.18227	2862	6.iv	26.iv.2013	J. Postlethwaite & S. Monckton		PCYU
C. dolator	M	I	SE of Mamiña A-629	-20.07805	-69.18227	2862	6.iv	26.iv.2013	J. Postlethwaite & S. Monckton		PCYU
C. dolator	M	I	SE of Mamiña A-629	-20.07805	-69.18227	2862	6.iv	26.iv.2013	J. Postlethwaite & S. Monckton		PCYU
C. dolator	F	I	SE of Mamiña A-629	-20.07805	-69.18227	2862	6.iv	26.iv.2013	J. Postlethwaite & S. Monckton		PCYU
C. dolator	F	I	Mamiña	-20.07684	-69.20460	2803	6.iv	26.iv.2013	J. Postlethwaite & S. Monckton		PCYU
C. dolator	F	I	Mamiña	-20.07684	-69.20460	2803	6.iv	26.iv.2013	J. Postlethwaite & S. Monckton		PCYU
C. dolator	F	I	Hwy A-65, Mamiña	-20.06972	-69.21962	2698	5.ii	6.iv.2013	J. Postlethwaite & S. Monckton		PCYU
C. dolator	M	I	S. of Mamiña A-65	-20.06431	-69.22201	2754	6.iv	26.iv.2013	J. Postlethwaite & S. Monckton		PCYU
C. dolator	F	I	Mamiña	-20.06371	-69.23058	2683	21.iv	10.v.2012	L. Packer		PCYU
C. dolator	F	I	Mamiña, Hwy A-65	-20.06200	-69.22208	2728	29.x.2013		S. Monckton		PCYU
C. dolator	M	I	Mamiña, Hwy A-65	-20.06200	-69.22208	2728	29.x.2013		S. Monckton		PCYU
C. dolator	M	I	Mamiña, Hwy A-65	-20.06200	-69.22208	2728	29.x.2013		S. Monckton		PCYU
C. dolator	F	I	Rd. to Parca, km 2	-20.05668	-69.23687	2671	29.x.2013		S. Monckton		PCYU
C. dolator	M	I	Rd. to Parca, km 2	-20.05668	-69.23687	2671	29.x.2013		S. Monckton		PCYU
C. dolator	M	I	Rd. to Parca, km 2	-20.05668	-69.23687	2671	29.x.2013		S. Monckton		PCYU
C. dolator	M	I	Rd. to Parca, km 2	-20.05668	-69.23687	2671	29.x.2013		S. Monckton		PCYU
C. dolator	F	I	Rd. to Parca. Km 5	-20.04260	-69.23242	2630	29.x	24.xi.2013	J. Postlethwaite & S. Monckton		PCYU
C. dolator	F	I	CH15, km 2	-19.99183	-69.74898	1108	21.ix	29.x.2013	J. Postlethwaite & S. Monckton		PCYU
C. dolator	F	I	CH15, km 3	-19.99183	-69.74898	1108	21.ix	29.x.2013	J. Postlethwaite & S. Monckton		PCYU
C. dolator	F	I	CH15, km 4	-19.99183	-69.74898	1108	20.ix	29.x.2013	J. Postlethwaite & S. Monckton		PCYU
C. dolator	F	I	10 km W. of Chusmiza	-19.80000	-69.30000		26.xi.2002		J. Grixti & A. Zayed	B09997-A10	PCYU
C. dolator	F	I	10 km W. of Chusmiza	-19.80000	-69.30000		26.xi.2002		J. Grixti & A. Zayed		PCYU
C. dolator	F	I	10 km W. of Chusmiza	-19.80000	-69.30000		26.xi.2002		J. Grixti & A. Zayed		PCYU

C. dolator	F	I	10 km W. of Chusmiza	-19.80000	-69.30000		26.xi.2002		J. Grixti & A. Zayed	PCYU
C. dolator	M	I	10 km W. of Chusmiza	-19.80000	-69.30000		26.xi.2002		J. Grixti & A. Zayed	PCYU
C. dolator	F	I	Hwy 15-CH, km 50	-19.79962	-69.35611	2381	14.iv	24.iv.2013	J. Postlethwaite & S. Monckton	PCYU
C. dolator	F	I	Hwy 15-CH, km 51	-19.79962	-69.35611	2381	14.iv	24.iv.2013	J. Postlethwaite & S. Monckton	PCYU
C. dolator	F	I	Hwy 15-CH, km 52	-19.79962	-69.35611	2381	14.iv	24.iv.2013	J. Postlethwaite & S. Monckton	PCYU
C. dolator	M	I	Hwy 15-CH, km 53	-19.79962	-69.35611	2381	14.iv	24.iv.2013	J. Postlethwaite & S. Monckton	PCYU
C. dolator	F	I	15-CH, km 53	-19.79729	-69.33114	2537	29.x	26.xi.2013	J. Postlethwaite & S. Monckton	PCYU
C. dolator	F	I	15-CH, km 54	-19.79729	-69.33114	2537	29.x	26.xi.2013	J. Postlethwaite & S. Monckton	PCYU
C. dolator	F	I	15-CH, km 55	-19.79729	-69.33114	2537	29.x	26.xi.2013	J. Postlethwaite & S. Monckton	PCYU
C. dolator	F	I	15-CH, km 56	-19.79729	-69.33114	2537	29.x	26.xi.2013	J. Postlethwaite & S. Monckton	PCYU
C. dolator	F	I	15-CH, km 54	-19.79347	-69.32174	2591	25.xi	1.xii.2013	J. Postlethwaite & S. Monckton	PCYU
C. dolator	F	I	15-CH, km 55	-19.79347	-69.32174	2591	29.x	25.xi.2013	J. Postlethwaite & S. Monckton	PCYU
C. dolator	M	I	15-CH, km 56	-19.79347	-69.32174	2591	25.xi	1.xii.2013	J. Postlethwaite & S. Monckton	PCYU
C. dolator	F	I	CH-15 km 60	-19.78340	-69.28724	2657	14.iv	24.iv.2013	J. Postlethwaite & S. Monckton	PCYU
C. dolator	F	I	CH-15 km 60	-19.78340	-69.28724	2657	14.iv	24.iv.2013	J. Postlethwaite & S. Monckton	PCYU
C. dolator	F	I	CH-15 km 62.600	-19.75352	-69.26018	2885	14.iv	24.iv.2013	J. Postlethwaite & S. Monckton	PCYU
C. dolator	F	I	CH-15 km 62.600	-19.75352	-69.26018	2885	14.iv	24.iv.2013	J. Postlethwaite & S. Monckton	PCYU
C. dolator	F	I	CH-15 km 62.600	-19.75352	-69.26018	2885	14.iv	24.iv.2013	J. Postlethwaite & S. Monckton	PCYU
C. dolator	M	I	CH-15 km 62.600	-19.75352	-69.26018	2885	14.iv	24.iv.2013	J. Postlethwaite & S. Monckton	PCYU
C. dolator	M	I	15-CH, SW of Chusmiza	-19.75173	-69.25770	3005	29.x	25.xi.2013	J. Postlethwaite & S. Monckton	PCYU
C. dolator	F	I	15-CH, SW of Chusmiza	-19.75173	-69.25770	3005	29.x	25.xi.2013	J. Postlethwaite & S. Monckton	PCYU
C. dolator	F	I	15-CH, SW of Chusmiza	-19.75173	-69.25770	3005	25.xi	1.xii.2013	J. Postlethwaite & S. Monckton	PCYU
C. dolator	F	I	15-CH, SW of Chusmiza	-19.75173	-69.25770	3005	25.xi	1.xii.2013	J. Postlethwaite & S. Monckton	PCYU
C. dolator	M	I	15-CH, km 63	-19.75173	-69.25770	3005	30.x.2013		S. Monckton	PCYU
C. dolator	M	I	CH-15 km 64.5	-19.74427	-69.24569	3086	25.xi	1.xii.2013	J. Postlethwaite & S. Monckton	PCYU
C. dolator	M	I	CH-15 km 64.5	-19.74427	-69.24569	3086	25.xi	1.xii.2013	J. Postlethwaite & S. Monckton	PCYU
C. dolator	M	I	15-CH Chusmiza	-19.72180	-69.22196	3226	21.ix	29.x.2013	J. Postlethwaite & S. Monckton	PCYU
C. dolator	M	I	15-CH Chusmiza	-19.72180	-69.22196	3226	21.xi	29.x.2013	J. Postlethwaite & S. Monckton	PCYU
C. dolator	F	I	15-CH Chusmiza	-19.72180	-69.22196	3226	21.ix	29.x.2013	J. Postlethwaite & S. Monckton	PCYU
C. dolator	F	I	15-CH Chusmiza	-19.72180	-69.22196	3226	21.ix	29.x.2013	J. Postlethwaite & S. Monckton	PCYU
C. dolator	F	I	15-CH Chusmiza	-19.72180	-69.22196	3226	21.ix	29.x.2013	J. Postlethwaite & S. Monckton	PCYU
C. dolator	F	I	15-CH Chusmiza	-19.72180	-69.22196	3226	21.ix	29.x.2013	J. Postlethwaite & S. Monckton	PCYU
C. dolator	F	I	15-CH Chusmiza	-19.72180	-69.22196	3226	21.ix	29.x.2013	J. Postlethwaite & S. Monckton	PCYU
C. dolator	F	I	15-CH Chusmiza	-19.72180	-69.22196	3226	21.ix	29.x.2013	J. Postlethwaite & S. Monckton	PCYU
C. dolator	F	I	15-CH Chusmiza	-19.72180	-69.22196	3226	21.xi	29.x.2013	J. Postlethwaite & S. Monckton	PCYU
C. dolator	F	I	15-CH Chusmiza	-19.72180	-69.22196	3226	21.xi	29.x.2013	J. Postlethwaite & S. Monckton	PCYU
C. dolator	F	I	15-CH Chusmiza	-19.72180	-69.22196	3226	21.xi	29.x.2013	J. Postlethwaite & S. Monckton	PCYU
C. dolator	F	I	15-CH Chusmiza	-19.72180	-69.22196	3226	21.xi	29.x.2013	J. Postlethwaite & S. Monckton	PCYU
C. dolator	F	I	15-CH Chusmiza	-19.72180	-69.22196	3226	21.xi	29.x.2013	J. Postlethwaite & S. Monckton	PCYU
C. dolator	F	I	15-CH Chusmiza	-19.72180	-69.22196	3226	21.xi	29.x.2013	J. Postlethwaite & S. Monckton	PCYU
C. dolator	F	I	15-CH Chusmiza	-19.72180	-69.22196	3226	21.xi	29.x.2013	J. Postlethwaite & S. Monckton	PCYU
C. dolator	F	I	15-CH Chusmiza	-19.72180	-69.22196	3226	21.xi	29.x.2013	J. Postlethwaite & S. Monckton	PCYU
C. dolator	F	I	15-CH Chusmiza	-19.72180	-69.22196	3226	21.xi	29.x.2013	J. Postlethwaite & S. Monckton	PCYU
C. dolator	F	I	15-CH Chusmiza	-19.72180	-69.22196	3226	21.xi	29.x.2013	J. Postlethwaite & S. Monckton	PCYU
C. dolator	F	I	15-CH Chusmiza	-19.72180	-69.22196	3226	21.xi	29.x.2013	J. Postlethwaite & S. Monckton	PCYU
C. dolator	F	I	15-CH Chusmiza	-19.72180	-69.22196	3226	21.xi	29.x.2013	J. Postlethwaite & S. Monckton	PCYU
C. dolator	F	I	15-CH Chusmiza	-19.72180	-69.22196	3226	21.xi	29.x.2013	J. Postlethwaite & S. Monckton	PCYU
C. dolator	F	I	15-CH Chusmiza	-19.72180	-69.22196	3226	21.xi	29.x.2013	J. Postlethwaite & S. Monckton	PCYU

C. dolator	F	I	15-CH Chusmiza	-19.72180	-69.22196	3226	21.xi	29.x.2013	J. Postlethwaite & S. Monckton		PCYU
C. dolator	F	I	15-CH Chusmiza	-19.72180	-69.22196	3226	21.xi	29.x.2013	J. Postlethwaite & S. Monckton		PCYU
C. dolator	F	I	15-CH Chusmiza	-19.72180	-69.22196	3226	21.xi	29.x.2013	J. Postlethwaite & S. Monckton		PCYU
C. dolator	F	I	15-CH Chusmiza	-19.72180	-69.22196	3226	21.xi	29.x.2013	J. Postlethwaite & S. Monckton		PCYU
C. dolator	F	I	15-CH Chusmiza	-19.72180	-69.22196	3226	21.xi	29.x.2013	J. Postlethwaite & S. Monckton		PCYU
C. dolator	F	I	15-CH Chusmiza	-19.72180	-69.22196	3226	21.xi	29.x.2013	J. Postlethwaite & S. Monckton	CCDB-22015 G06	PCYU
C. dolator	F	I	15-CH Chusmiza	-19.72180	-69.22196	3226	21.ix	29.x.2013	J. Postlethwaite & S. Monckton		PCYU
C. dolator	F	I	15-CH Chusmiza	-19.72180	-69.22196	3226	21.ix	29.x.2013	J. Postlethwaite & S. Monckton		PCYU
C. dolator	F	I	15-CH Chusmiza	-19.72180	-69.22196	3226	21.ix	29.x.2013	J. Postlethwaite & S. Monckton		PCYU
C. dolator	F	I	15-CH Chusmiza	-19.72180	-69.22196	3226	21.ix	29.x.2013	J. Postlethwaite & S. Monckton		PCYU
C. dolator	F	I	15-CH Chusmiza	-19.72180	-69.22196	3226	24.xi	1.xii.2013	J. Postlethwaite & S. Monckton		PCYU
C. dolator	F	I	15-CH Chusmiza	-19.72180	-69.22196	3226	21.ix	29.x.2013	J. Postlethwaite & S. Monckton		PCYU
C. dolator	M	I	15-CH Chusmiza	-19.72180	-69.22196	3226	21.ix	29.x.2013	J. Postlethwaite & S. Monckton		PCYU
C. dolator	M	I	15-CH Chusmiza	-19.72180	-69.22196	3226	21.ix	29.x.2013	J. Postlethwaite & S. Monckton		PCYU
C. dolator	M	I	15-CH Chusmiza	-19.72180	-69.22196	3226	21.ix	29.x.2013	J. Postlethwaite & S. Monckton		PCYU
C. dolator	M	I	15-CH Chusmiza	-19.72180	-69.22196	3226	21.ix	29.x.2013	J. Postlethwaite & S. Monckton		PCYU
C. dolator	M	I	15-CH Chusmiza	-19.72180	-69.22196	3226	21.ix	29.x.2013	J. Postlethwaite & S. Monckton		PCYU
C. dolator	M	I	CH-15 km 79	-19.66170	-69.14575	3607	14.iv	24.iv.2013	J. Postlethwaite & S. Monckton		PCYU
C. dolator	F	I	CH-15 km 79	-19.66170	-69.14575	3607	14.iv	24.iv.2013	J. Postlethwaite & S. Monckton		PCYU
C. dolator	F	I	CH-15 km 79	-19.66170	-69.14575	3607	14.iv	24.iv.2013	J. Postlethwaite & S. Monckton		PCYU
C. dolator	M	I	Yala-yala	-19.30000	-69.40000	2800	11.iv.2004		L. Packer		PCYU
C. dolator	F	I	Yala-yala	-19.30000	-69.40000	2800	11.iv.2004		L. Packer		PCYU
C. dolator	F	II	50 km SW of Peine	-24.09683	-68.29408	3060	2.iv	1.v.2013	J. Postlethwaite & S. Monckton	CCDB-22014 D01	PCYU
C. dolator	F	II	27-CH, km 17	-22.91357	-68.02657	2885	26.x.2013		S. Monckton		PCYU
C. dolator	M	II	27-CH, km 17	-22.91357	-68.02657	2885	26.x.2013		S. Monckton		PCYU
C. dolator	M	II	Hwy 27-CH, km 25.6	-22.91088	-67.94342	3473	24.i	6.iv.2013	J. Postlethwaite & S. Monckton		PCYU
C. dolator	F	II	Hwy 27-CH, km 19.9	-22.91061	-68.00141	3045	24.i	6.iv.2013	J. Postlethwaite & S. Monckton		PCYU
C. dolator	M	II	E. of SP de Atacama. Hwy 23, km 25.4	-22.90000	-67.90000	3440	iv.2004		L. Packer		PCYU
C. dolator	F	II	N. of SP de Atacama, B245, km 12	-22.82718	-68.12890	2801	21.xi	6.xii.2013	J. Postlethwaite & S. Monckton	CCDB-22790 H08	PCYU
C. dolator	F	II	Hwy B-245, km 30	-22.71701	-68.02673	3682	3.iv	2.v.2013	J. Postlethwaite & S. Monckton		PCYU
C. dolator	F	II	Hwy B-245, km 30	-22.71701	-68.02673	3682	3.iv	2.v.2013	J. Postlethwaite & S. Monckton		PCYU
C. dolator	F	II	N. of Puritama	-22.71397	-68.02596	3738	19.xi	27.x.2013	J. Postlethwaite & S. Monckton		PCYU
C. dolator	F	II	Hwy B-159, km 11.2	-22.40431	-68.19933	3603	25.x	5.xii.2013	J. Postlethwaite & S. Monckton		PCYU
C. dolator	F	II	Hwy B-159, km 11.2	-22.40431	-68.19933	3603	25.x	5.xii.2013	J. Postlethwaite & S. Monckton		PCYU
C. dolator	F	II	Hwy 24, km 56.8	-22.31604	-69.05415	2631	20.xi	22.xi.2013	J. Postlethwaite & S. Monckton		PCYU
C. dolator	F	II	Hwy 24, km 56.8	-22.31604	-69.05415	2631	20.xi	22.xi.2013	J. Postlethwaite & S. Monckton		PCYU
C. dolator	F	II	Hwy 24, km 56.8	-22.31604	-69.05415	2631	20.xi	22.xi.2013	J. Postlethwaite & S. Monckton		PCYU
C. dolator	F	II	Hwy 24, km 56.8	-22.31604	-69.05415	2631	20.xi	22.xi.2013	J. Postlethwaite & S. Monckton		PCYU
C. dolator	F	II	Hwy 24, km 56.8	-22.31604	-69.05415	2631	20.xi	22.xi.2013	J. Postlethwaite & S. Monckton		PCYU
C. dolator	F	II	Hwy 24, km 56.8	-22.31604	-69.05415	2631	22.xi.2013	4.xii.2013	J. Postlethwaite & S. Monckton		PCYU
C. dolator	F	II	Hwy 24, km 56.8	-22.31604	-69.05415	2631	22.xi.2013	4.xii.2013	J. Postlethwaite & S. Monckton		PCYU
C. dolator	M	II	Hwy 24, km 56.8	-22.31604	-69.05415	2631	20.xi	22.xi.2013	J. Postlethwaite & S. Monckton		PCYU
C. dolator	F	II	Hwy 24, km 56.8	-22.31604	-69.05415	2631	20.xi	22.xi.2013	J. Postlethwaite & S. Monckton		PCYU
C. dolator	F	II	Palo Buque	-20.38184	-70.14907	479	27.x.2016		L. Packer		PCYU
C. dolator	F	XV	Hwy A-31, SE of Arica	-18.77007	-69.92220	1498	17.iv	30.iv.2013	J. Postlethwaite & S. Monckton		PCYU
C. dolator	F	XV	Timar A-35 Rd to Codpa	-18.75675	-69.69946	2414	17.iv	1.v.2013	J. Postlethwaite & S. Monckton		PCYU
C. dolator	F	XV	Timar A-35 Rd to Codpa	-18.75675	-69.69946	2414	17.iv	1.v.2013	J. Postlethwaite & S. Monckton		PCYU
C. dolator	F	XV	Timar A-35 Rd to Codpa	-18.75118	-69.70213	2414	17.iv	1.v.2013	J. Postlethwaite & S. Monckton		PCYU
C. dolator	F	XV	Timar A-35 Rd to Codpa	-18.75118	-69.70213	2414	17.iv	1.v.2013	J. Postlethwaite & S. Monckton		PCYU

C. dolator	M	XV	Hwy A-31, marker 56.400	-18.74579	-69.77837	2011	31.x	30.ix.2013	J. Postlethwaite & S. Monckton	PCYU
C. dolator	M	XV	Hwy A-31, marker 56.400	-18.74579	-69.77837	2011	31.x	30.ix.2013	J. Postlethwaite & S. Monckton	PCYU
C. dolator	M	XV	Hwy A-31, marker 56.400	-18.74579	-69.77837	2011	31.x	30.ix.2013	J. Postlethwaite & S. Monckton	PCYU
C. dolator	F	XV	Hwy A-31, marker 56.400	-18.74579	-69.77837	2011	24.ix	31.x.2013	J. Postlethwaite & S. Monckton	PCYU
C. dolator	F	XV	Hwy A-31, marker 56.400	-18.74579	-69.77837	2011	24.ix	31.x.2013	J. Postlethwaite & S. Monckton	PCYU
C. dolator	F	XV	Hwy A-31, marker 56.400	-18.74579	-69.77837	2011	24.ix	31.x.2013	J. Postlethwaite & S. Monckton	PCYU
C. dolator	F	XV	Hwy A-31, marker 56.400	-18.74579	-69.77837	2011	24.ix	31.x.2013	J. Postlethwaite & S. Monckton	PCYU
C. dolator	F	XV	Hwy A-31, marker 56.400	-18.74579	-69.77837	2011	31.x.2013	30.ix.2013	J. Postlethwaite & S. Monckton	PCYU
C. dolator	F	XV	Hwy A-31, marker 56.400	-18.74579	-69.77837	2011	31.i	17.iv.2013	J. Postlethwaite & S. Monckton	PCYU
C. dolator	F	XV	Hwy A-31, marker 56.400	-18.74579	-69.77837	2011	24.ix	31.x.2013	J. Postlethwaite & S. Monckton	PCYU
C. dolator	F	XV	Hwy A-31, marker 56.400	-18.74579	-69.77837	2011	24.ix	31.x.2013	J. Postlethwaite & S. Monckton	PCYU
C. dolator	F	XV	Hwy A-31, marker 56.400	-18.74579	-69.77837	2011	24.ix	31.x.2013	J. Postlethwaite & S. Monckton	PCYU
C. dolator	F	XV	Hwy A-31, marker 56.400	-18.74579	-69.77837	2011	31.x	30.xi.2013	J. Postlethwaite & S. Monckton	PCYU
C. dolator	F	XV	Hwy A-31, marker 56.400	-18.74579	-69.77837	2011	31.x	30.xi.2013	J. Postlethwaite & S. Monckton	PCYU
C. dolator	F	XV	Hwy A-31, marker 56.400	-18.74579	-69.77837	2011	31.x	30.xi.2013	J. Postlethwaite & S. Monckton	PCYU
C. dolator	F	XV	Hwy A-31, marker 56.400	-18.74579	-69.77837	2011	24.ix	31.x.2013	J. Postlethwaite & S. Monckton	PCYU
C. dolator	F	XV	Hwy A-31, marker 56.400	-18.74579	-69.77837	2011	24.ix	31.x.2013	J. Postlethwaite & S. Monckton	PCYU
C. dolator	F	XV	Hwy A-31, marker 56.400	-18.74579	-69.77837	2011	24.ix	31.x.2013	J. Postlethwaite & S. Monckton	PCYU
C. dolator	F	XV	Hwy A-31, marker 56.400	-18.74579	-69.77837	2011	31.i	17.iv.2013	J. Postlethwaite & S. Monckton	PCYU
C. dolator	F	XV	Hwy A-31, marker 56.400	-18.74579	-69.77837	2011	31.i	17.iv.2013	J. Postlethwaite & S. Monckton	PCYU
C. dolator	F	XV	Hwy A-31, marker 56.400	-18.74579	-69.77837	2011	31.i	17.iv.2013	J. Postlethwaite & S. Monckton	PCYU
C. dolator	F	XV	Hwy A-31, marker 56.400	-18.74579	-69.77837	2011	24.ix	31.x.2013	J. Postlethwaite & S. Monckton	PCYU
C. dolator	F	XV	Hwy A-31, marker 56.400	-18.74579	-69.77837	2011	24.ix	31.x.2013	J. Postlethwaite & S. Monckton	PCYU
C. dolator	F	XV	Hwy A-31, marker 56.400	-18.74579	-69.77837	2011	24.ix	31.x.2013	J. Postlethwaite & S. Monckton	PCYU
C. dolator	F	XV	Hwy A-31, marker 56.400	-18.74579	-69.77837	2011	24.ix	31.x.2013	J. Postlethwaite & S. Monckton	PCYU
C. dolator	M	XV	Hwy A-31, marker 56.400	-18.74376	-69.76922	2090	21.ix	31.x.2013	J. Postlethwaite & S. Monckton	PCYU
C. dolator	M	XV	Hwy A-31, marker 56.400	-18.74376	-69.76922	2090	24.ix	31.x.2013	J. Postlethwaite & S. Monckton	PCYU
C. dolator	F	XV	Hwy A-31, marker 56.400	-18.74376	-69.76922	2090	24.ix	31.x.2013	J. Postlethwaite & S. Monckton	PCYU
C. dolator	F	XV	Hwy A-31, marker 56.400	-18.74376	-69.76922	2090	24.ix	31.x.2013	J. Postlethwaite & S. Monckton	PCYU
C. dolator	F	XV	Hwy A-31, marker 56.400	-18.74376	-69.76922	2090	24.ix	31.x.2013	J. Postlethwaite & S. Monckton	PCYU
C. dolator	F	XV	Hwy A-31, marker 56.400	-18.74376	-69.76922	2090	24.ix	31.x.2013	J. Postlethwaite & S. Monckton	PCYU
C. dolator	F	XV	Hwy A-31, marker 56.400	-18.74376	-69.76922	2090	24.ix	31.x.2013	J. Postlethwaite & S. Monckton	PCYU
C. dolator	F	XV	Hwy A-31, marker 56.400	-18.74376	-69.76922	2090	24.ix	31.x.2013	J. Postlethwaite & S. Monckton	PCYU
C. dolator	F	XV	Hwy A-31, marker 56.400	-18.74376	-69.76922	2090	24.ix	31.x.2013	J. Postlethwaite & S. Monckton	PCYU
C. dolator	F	XV	Hwy A-31, marker 56.400	-18.74376	-69.76922	2090	24.ix	31.x.2013	J. Postlethwaite & S. Monckton	PCYU
C. dolator	F	XV	Hwy A-31, marker 56.400	-18.74376	-69.76922	2090	24.ix	31.x.2013	J. Postlethwaite & S. Monckton	PCYU
C. dolator	M	XV	A-31 Timar turnoff	-18.73081	-69.70972	2440	24.xi	30.xi.2013	J. Postlethwaite & S. Monckton	PCYU
C. dolator	M	XV	A-31 Timar turnoff	-18.73081	-69.70972	2440	24.xi	30.xi.2013	J. Postlethwaite & S. Monckton	PCYU
C. dolator	M	XV	A-31 Timar turnoff	-18.73081	-69.70972	2440	24.xi	30.xi.2013	J. Postlethwaite & S. Monckton	PCYU
C. dolator	M	XV	A-31 Timar turnoff	-18.73081	-69.70972	2440	21.ix	30.ix.2013	J. Postlethwaite & S. Monckton	PCYU
C. dolator	F	XV	A-31 Timar turnoff	-18.73081	-69.70972	2440	24.ix	30.xi.2013	J. Postlethwaite & S. Monckton	PCYU
C. dolator	F	XV	A-31 Timar turnoff	-18.73081	-69.70972	2440	24.ix	30.xi.2013	J. Postlethwaite & S. Monckton	PCYU
C. dolator	F	XV	A-31 Timar turnoff	-18.73081	-69.70972	2440	24.ix	30.xi.2013	J. Postlethwaite & S. Monckton	PCYU
C. dolator	F	XV	A-31 Timar turnoff	-18.73081	-69.70972	2440	24.ix	30.xi.2013	J. Postlethwaite & S. Monckton	PCYU
C. dolator	F	XV	A-31 Timar turnoff	-18.73081	-69.70972	2440	24.ix	30.xi.2013	J. Postlethwaite & S. Monckton	PCYU
C. dolator	F	XV	A-31 Timar turnoff	-18.73081	-69.70972	2440	24.ix	30.xi.2013	J. Postlethwaite & S. Monckton	PCYU
C. dolator	F	XV	A-31 Timar turnoff	-18.73081	-69.70972	2440	24.ix	30.xi.2013	J. Postlethwaite & S. Monckton	PCYU
C. dolator	F	XV	A-31 Timar turnoff	-18.73081	-69.70972	2440	24.ix	30.xi.2013	J. Postlethwaite & S. Monckton	PCYU
C. dolator	F	XV	Hwy A-31, Chapiquiña turnoff	-18.72685	-69.70205	2497	31.i	17.iv.2013	J. Postlethwaite & S. Monckton	PCYU

C. dolator	F	XV	Hwy A-31, Chapiquiña turnoff	-18.72685	-69.70205	2497	31.i	17.iv.2013	J. Postlethwaite & S. Monckton	PCYU
C. dolator	F	XV	Hwy A-31, Chapiquiña turnoff	-18.72685	-69.70205	2497	17.iv	30.iv.2013	J. Postlethwaite & S. Monckton	PCYU
C. dolator	F	XV	Hwy A-31, Chapiquiña turnoff	-18.72685	-69.70205	2497	17.iv	30.iv.2013	J. Postlethwaite & S. Monckton	PCYU
C. dolator	F	XV	Hwy A-31, Chapiquiña turnoff	-18.72685	-69.70205	2497	31.i	17.iv.2013	J. Postlethwaite & S. Monckton	PCYU
C. dolator	F	XV	Hwy A-31, SE of Arica	-18.71967	-70.08816	1002	31.x	30.xi.2013	J. Postlethwaite & S. Monckton	PCYU
C. dolator	F	XV	Hwy A-31, SE of Arica	-18.71967	-70.08816	1002	31.x	30.xi.2013	J. Postlethwaite & S. Monckton	PCYU
C. dolator	M	XV	Rd to Cobija	-18.71826	-69.60983	3105	18.iv	1.v.2013	J. Postlethwaite & S. Monckton	PCYU
C. dolator	M	XV	Hwy A-31, marker 73240	-18.71350	-69.64336	3020	17.iv	1.v.2013	J. Postlethwaite & S. Monckton	PCYU
C. dolator	M	XV	Hwy A-31, marker 73240	-18.71350	-69.64336	3020	31.i	17.iv.2013	J. Postlethwaite & S. Monckton	PCYU
C. dolator	M	XV	Hwy A-31, marker 73240	-18.71350	-69.64336	3020	31.i	17.iv.2013	J. Postlethwaite & S. Monckton	PCYU
C. dolator	M	XV	Hwy A-31, marker 73240	-18.71350	-69.64336	3020	31.i	17.iv.2013	J. Postlethwaite & S. Monckton	PCYU
C. dolator	M	XV	Hwy A-31, marker 73240	-18.71350	-69.64336	3020	17.iv	1.v.2013	J. Postlethwaite & S. Monckton	PCYU
C. dolator	F	XV	Hwy A-31, marker 73240	-18.71350	-69.64336	3020	17.iv	1.v.2013	J. Postlethwaite & S. Monckton	PCYU
C. dolator	F	XV	Hwy A-31, marker 73240	-18.71350	-69.64336	3020	31.i	17.iv.2013	J. Postlethwaite & S. Monckton	PCYU
C. dolator	F	XV	Hwy A-31, marker 73240	-18.71350	-69.64336	3020	17.iv	1.v.2013	J. Postlethwaite & S. Monckton	PCYU
C. dolator	F	XV	Hwy A-31, marker 73240	-18.71350	-69.64336	3020	31.i	17.iv.2013	J. Postlethwaite & S. Monckton	PCYU
C. dolator	F	XV	Hwy A-31, marker 73240	-18.71350	-69.64336	3020	31.i	17.iv.2013	J. Postlethwaite & S. Monckton	PCYU
C. dolator	F	XV	Hwy A-31, marker 73240	-18.71350	-69.64336	3020	31.i	17.iv.2013	J. Postlethwaite & S. Monckton	PCYU
C. dolator	F	XV	Hwy A-31, marker 73240	-18.71350	-69.64336	3020	31.i	17.iv.2013	J. Postlethwaite & S. Monckton	PCYU
C. dolator	F	XV	Hwy A-31, marker 73240	-18.71350	-69.64336	3020	31..i	17.iv.2013	J. Postlethwaite & S. Monckton	PCYU
C. dolator	F	XV	Hwy A-31, marker 73240	-18.71350	-69.64336	3020	17.iv	1.v.2013	J. Postlethwaite & S. Monckton	PCYU
C. dolator	M	XV	Hwy A-31, marker 73240	-18.71350	-69.64336	3020	17.iv	1.v.2013	J. Postlethwaite & S. Monckton	PCYU
C. dolator	F	XV	Hwy A-31, marker 73240	-18.71350	-69.64336	3020	17.iv	1.v.2013	J. Postlethwaite & S. Monckton	PCYU
C. dolator	M	XV	Hwy A-31, km 74	-18.69880	-69.60847	3030	24.ix	31.x.2013	J. Postlethwaite & S. Monckton	PCYU
C. dolator	M	XV	Hwy A-31, km 74	-18.69880	-69.60847	3030	24.ix	31.x.2013	J. Postlethwaite & S. Monckton	PCYU
C. dolator	F	XV	Hwy A-31, km 74	-18.69880	-69.60847	3030	31.x	30.xi.2013	J. Postlethwaite & S. Monckton	PCYU
C. dolator	F	XV	Hwy A-31, km 74	-18.69880	-69.60847	3030	24.ix	13.x.2013	J. Postlethwaite & S. Monckton	PCYU
C. dolator	M	XV	Hwy A-31, km 74	-18.69880	-69.60847	3030	24.ix	31.x.2013	J. Postlethwaite & S. Monckton	PCYU
C. dolator	F	XV	Hwy A-31, km 74	-18.69880	-69.60847	3030	31.x	30.xi.2013	J. Postlethwaite & S. Monckton	PCYU
C. dolator	F	XV	Hwy A-31, km 74	-18.69880	-69.60847	3030	24.ix	31.x.2013	J. Postlethwaite & S. Monckton	PCYU
C. dolator	F	XV	Hwy A-31, km 74	-18.69880	-69.60847	3030	31.x	30.xi.2013	J. Postlethwaite & S. Monckton	PCYU
C. dolator	F	XV	Hwy A-31, km 74	-18.69880	-69.60847	3030	31.x	30.xi.2013	J. Postlethwaite & S. Monckton	PCYU
C. dolator	F	XV	Hwy A-31, km 74	-18.69880	-69.60847	3030	24.ix	31.x.2013	J. Postlethwaite & S. Monckton	PCYU
C. dolator	F	XV	Hwy A-31, km 74	-18.69880	-69.60847	3030	31.x	30.xi.2013	J. Postlethwaite & S. Monckton	PCYU
C. dolator	F	XV	Hwy A-31, km 74	-18.69880	-69.60847	3030	24.ix	31.x.2013	J. Postlethwaite & S. Monckton	PCYU
C. dolator	M	XV	Hwy A-31, km 74	-18.69880	-69.60847	3030	31.x	30.xi.2013	J. Postlethwaite & S. Monckton	PCYU
C. dolator	F	XV	Hwy A-31, SW of Tignamar	-18.69879	-69.60845	3047	31.i	1.iv.2013	J. Postlethwaite & S. Monckton	PCYU
C. dolator	F	XV	Hwy A-31, SW of Tignamar	-18.69879	-69.60845	3047	1.iv	1.v.2013	J. Postlethwaite & S. Monckton	PCYU
C. dolator	F	XV	Hwy A-31, SW of Tignamar	-18.69879	-69.60845	3047	1.iv	1.v.2013	J. Postlethwaite & S. Monckton	PCYU
C. dolator	M	XV	Hwy A-31, SW of Tignamar	-18.69879	-69.60845	3047	1.iv	1.v.2013	J. Postlethwaite & S. Monckton	PCYU
C. dolator	F	XV	Hwy A-31, SW of Tignamar	-18.69879	-69.60845	3047	31.i	1.iv.2013	J. Postlethwaite & S. Monckton	PCYU
C. dolator	M	XV	Hwy A-31, km 91	-18.65745	-69.53724	3447	31.x	31.xi.2013	J. Postlethwaite & S. Monckton	PCYU
C. dolator	M	XV	Hwy A-31, km 91	-18.65745	-69.53724	3447	21.ix	31.x.2013	J. Postlethwaite & S. Monckton	PCYU
C. dolator	F	XV	Hwy A-31, km 91	-18.65745	-69.53724	3447	31.x	30.ix.2013	J. Postlethwaite & S. Monckton	PCYU
C. dolator	F	XV	Hwy A-31, km 91	-18.65745	-69.53724	3447	31.x	30.ix.2013	J. Postlethwaite & S. Monckton	PCYU
C. dolator	F	XV	Hwy A-31, km 91	-18.65745	-69.53724	3447	31.x	30.ix.2013	J. Postlethwaite & S. Monckton	PCYU
C. dolator	F	XV	Hwy A-31, km 91	-18.65745	-69.53724	3447	31.x	30.ix.2013	J. Postlethwaite & S. Monckton	PCYU
C. dolator	F	XV	Hwy A-31, km 91	-18.65745	-69.53724	3447	31.x	30.ix.2013	J. Postlethwaite & S. Monckton	PCYU
C. dolator	F	XV	Hwy A-31, km 91	-18.65745	-69.53724	3447	24.ix	31.x.2013	J. Postlethwaite & S. Monckton	PCYU

C. dolator	F	XV	Hwy A-31, km 91	-18.65745	-69.53724	3447	24.ix	31.x.2013	J. Postlethwaite & S. Monckton		PCYU
C. dolator	F	XV	Hwy A-31, km 91	-18.65745	-69.53724	3447	24.ix	31.x.2013	J. Postlethwaite & S. Monckton		PCYU
C. dolator	F	XV	Hwy A-31, km 91	-18.65745	-69.53724	3447	24.ix	31.x.2013	J. Postlethwaite & S. Monckton		PCYU
C. dolator	F	XV	Hwy A-31, km 91	-18.65745	-69.53724	3447	24.ix	31.x.2013	J. Postlethwaite & S. Monckton		PCYU
C. dolator	F	XV	Hwy A-31, km 91	-18.65745	-69.53724	3447	24.ix	31.x.2013	J. Postlethwaite & S. Monckton		PCYU
C. dolator	F	XV	Hwy A-31, km 91	-18.65745	-69.53724	3447	31.x.2013	30.xi.2013	J. Postlethwaite & S. Monckton		PCYU
C. dolator	F	XV	Hwy A-31, km 91	-18.65745	-69.53724	3447	24.ix	31.x.2013	J. Postlethwaite & S. Monckton		PCYU
C. dolator	F	XV	Hwy A-31, km 91	-18.65745	-69.53724	3447	31.x	30.xi.2013	J. Postlethwaite & S. Monckton		PCYU
C. dolator	F	XV	Hwy A-31, km 91	-18.65745	-69.53724	3447	31.x	30.xi.2013	J. Postlethwaite & S. Monckton		PCYU
C. dolator	F	XV	Hwy A-31, km 91	-18.65745	-69.53724	3447	31.x	30.xi.2013	J. Postlethwaite & S. Monckton		PCYU
C. dolator	F	XV	Hwy A-31, km 91	-18.65745	-69.53724	3447	31.x	30.xi.2013	J. Postlethwaite & S. Monckton		PCYU
C. dolator	F	XV	Hwy A-31, km 91	-18.65745	-69.53724	3447	31.x	30.xi.2013	J. Postlethwaite & S. Monckton		PCYU
C. dolator	F	XV	Hwy A-31, km 91	-18.65745	-69.53724	3447	31.x	30.xi.2013	J. Postlethwaite & S. Monckton		PCYU
C. dolator	F	XV	Hwy A-31, km 91	-18.65745	-69.53724	3447	31.x	30.xi.2013	J. Postlethwaite & S. Monckton		PCYU
C. dolator	F	XV	Hwy A-31, km 91	-18.65745	-69.53724	3447	31.x	30.xi.2013	J. Postlethwaite & S. Monckton		PCYU
C. dolator	F	XV	Hwy A-31, km 91	-18.65745	-69.53724	3447	31.x	30.xi.2013	J. Postlethwaite & S. Monckton		PCYU
C. dolator	F	XV	Hwy A-31, km 91	-18.65745	-69.53724	3447	31.x	30.xi.2013	J. Postlethwaite & S. Monckton		PCYU
C. dolator	F	XV	Hwy A-31, km 91	-18.65745	-69.53724	3447	24.ix	31.x.2013	J. Postlethwaite & S. Monckton	CCDB-22015 G02	PCYU
C. dolator	F	XV	Hwy A-31, km 91	-18.65745	-69.53724	3447	31.x	30.xi.2013	J. Postlethwaite & S. Monckton		PCYU
C. dolator	F	XV	Hwy A-31, km 91	-18.65745	-69.53724	3447	31.x	30.xi.2013	J. Postlethwaite & S. Monckton		PCYU
C. dolator	F	XV	Hwy A-31, km 91	-18.65745	-69.53724	3447	31.x	30.xi.2013	J. Postlethwaite & S. Monckton		PCYU
C. dolator	M	XV	Hwy A-31, km 91	-18.65745	-69.53724	3447	24.ix	31.x.2013	J. Postlethwaite & S. Monckton		PCYU
C. dolator	M	XV	Hwy A-31, km 91	-18.65745	-69.53724	3447	24.ix	31.x.2013	J. Postlethwaite & S. Monckton		PCYU
C. dolator	M	XV	Hwy A-31, km 91	-18.65745	-69.53724	3447	24.ix	31.x.2013	J. Postlethwaite & S. Monckton		PCYU
C. dolator	M	XV	Hwy A-31, km 91	-18.65745	-69.53724	3447	24.xi	31.x.2013	J. Postlethwaite & S. Monckton		PCYU
C. dolator	M	XV	Hwy A-31, km 91	-18.65745	-69.53724	3447	24.xi	31.x.2013	J. Postlethwaite & S. Monckton		PCYU
C. dolator	M	XV	Hwy A-31, km 91	-18.65745	-69.53724	3447	24.xi	31.x.2013	J. Postlethwaite & S. Monckton		PCYU
C. dolator	M	XV	Hwy A-31, km 91	-18.65745	-69.53724	3447	24.xi	31.x.2013	J. Postlethwaite & S. Monckton		PCYU
C. dolator	M	XV	Hwy A-31, km 91	-18.65745	-69.53724	3447	24.xi	31.x.2013	J. Postlethwaite & S. Monckton		PCYU
C. dolator	M	XV	Hwy A-31, km 91	-18.65745	-69.53724	3447	24.xi	31.x.2013	J. Postlethwaite & S. Monckton		PCYU
C. dolator	M	XV	Hwy A-31, km 91	-18.65745	-69.53724	3447	24.xi	31.x.2013	J. Postlethwaite & S. Monckton		PCYU
C. dolator	M	XV	Hwy A-31, km 91	-18.65745	-69.53724	3447	24.xi	31.x.2013	J. Postlethwaite & S. Monckton		PCYU
C. dolator	M	XV	Hwy A-31, km 91	-18.65745	-69.53724	3447	24.xi	31.x.2013	J. Postlethwaite & S. Monckton		PCYU
C. dolator	M	XV	Hwy A-31, km 91	-18.65745	-69.53724	3447	24.xi	31.x.2013	J. Postlethwaite & S. Monckton		PCYU
C. dolator	M	XV	Hwy A-31, km 91	-18.65745	-69.53724	3447	31.x.2013	30.xi.2013	J. Postlethwaite & S. Monckton		PCYU
C. dolator	M	XV	Hwy A-31, km 91	-18.65745	-69.53724	3447	31.x.2013	30.xi.2013	J. Postlethwaite & S. Monckton		PCYU
C. dolator	F	XV	Hwy A-31, km 91	-18.65745	-69.53724	3447	31.x.2013	30.xi.2013	J. Postlethwaite & S. Monckton		PCYU
C. dolator	F	XV	Hwy A-31, km 91	-18.65745	-69.53724	3447	31.x.2013	30.xi.2013	J. Postlethwaite & S. Monckton		PCYU
C. dolator	M	XV	Hwy A-31, km 91	-18.65745	-69.53724	3447	24.xi	31.x.2013	J. Postlethwaite & S. Monckton		PCYU
C. dolator	M	XV	Hwy A-31, km 91	-18.65745	-69.53724	3447	31.x	30.xi.2013	J. Postlethwaite & S. Monckton		PCYU
C. dolator	M	XV	Hwy A-31, marker 91660	-18.65380	-69.53246	3503	18.iv	1.v.2013	J. Postlethwaite & S. Monckton		PCYU
C. dolator	M	XV	Hwy A-31, marker 91660	-18.65380	-69.53246	3503	18.iv	1.v.2013	J. Postlethwaite & S. Monckton		PCYU
C. dolator	F	XV	Hwy A-31, marker 91660	-18.65380	-69.53246	3503	31.i	18.iv.2013	J. Postlethwaite & S. Monckton		PCYU
C. dolator	F	XV	Hwy A-31, marker 91660	-18.65380	-69.53246	3503	31.i	18.iv.2013	J. Postlethwaite & S. Monckton		PCYU
C. dolator	F	XV	Hwy A-31, marker 91660	-18.65380	-69.53246	3503	31.i	18.iv.2013	J. Postlethwaite & S. Monckton		PCYU
C. dolator	F	XV	Hwy A-31, marker 91660	-18.65380	-69.53246	3503	18.iv.2013	1.v.2013	J. Postlethwaite & S. Monckton		PCYU
C. dolator	F	XV	Hwy A-31, marker 91660	-18.65380	-69.53246	3503	18.iv.2013	1.v.2013	J. Postlethwaite & S. Monckton		PCYU
C. dolator	F	XV	Hwy A-31, marker 91660	-18.65380	-69.53246	3503	31.i	18.iv.2013	J. Postlethwaite & S. Monckton		PCYU
C. dolator	F	XV	Hwy A-31, marker 91660	-18.65380	-69.53246	3503	31.i	18.iv.2013	J. Postlethwaite & S. Monckton		PCYU

C. dolator	F	XV	Hwy A-31, marker 91660	-18.65380	-69.53246	3503	31.i	18.iv.2013	J. Postlethwaite & S. Monckton		PCYU
C. dolator	F	XV	Hwy A-31, marker 91660	-18.65380	-69.53246	3503	31.i	18.iv.2013	J. Postlethwaite & S. Monckton		PCYU
C. dolator	F	XV	Hwy A-31, marker 91660	-18.65380	-69.53246	3503	31.i	18.iv.2013	J. Postlethwaite & S. Monckton		PCYU
C. dolator	F	XV	Hwy A-31, marker 91660	-18.65380	-69.53246	3503	31.i	18.iv.2013	J. Postlethwaite & S. Monckton		PCYU
C. dolator	F	XV	Hwy A-31, marker 91660	-18.65380	-69.53246	3503	31.i	18.iv.2013	J. Postlethwaite & S. Monckton		PCYU
C. dolator	F	XV	Hwy A-31, marker 91660	-18.65380	-69.53246	3503	31.i	18.iv.2013	J. Postlethwaite & S. Monckton		PCYU
C. dolator	F	XV	Hwy A-31, marker 91660	-18.65380	-69.53246	3503	31.i	18.iv.2013	J. Postlethwaite & S. Monckton		PCYU
C. dolator	F	XV	Hwy A-31, marker 91660	-18.65380	-69.53246	3503	31.i	18.iv.2013	J. Postlethwaite & S. Monckton	CCDB-22790 H02	PCYU
C. dolator	M	XV	Hwy A-31, marker 91660	-18.65380	-69.53246	3503	31.i	18.iv.2013	J. Postlethwaite & S. Monckton		PCYU
C. dolator	F	XV	Hwy A-31, rd. to Ticnamar	-18.63221	-70.25614	578	24.ix	31.x.2013	J. Postlethwaite & S. Monckton		PCYU
C. dolator	F	XV	Hwy A-31, rd. to Ticnamar	-18.63221	-70.25614	578	24.ix	31.x.2013	J. Postlethwaite & S. Monckton		PCYU
C. dolator	F	XV	A-31 S. of Tignamar	-18.58681	-69.52354	3392	18.iv	1.v.2013	J. Postlethwaite & S. Monckton		PCYU
C. dolator	F	XV	A-31 S. of Tignamar	-18.58681	-69.52354	3392	18.iv	1.v.2013	J. Postlethwaite & S. Monckton		PCYU
C. dolator	M	XV	A-31 S. of Tignamar	-18.58681	-69.52354	3392	18.iv	1.v.2013	J. Postlethwaite & S. Monckton		PCYU
C. dolator	M	XV	Tignamar	-18.57662	-69.50507	3184	18.iv	1.v.2013	J. Postlethwaite & S. Monckton		PCYU
C. dolator	M	XV	Tignamar	-18.57662	-69.50507	3184	18.iv	1.v.2013	J. Postlethwaite & S. Monckton		PCYU
C. dolator	F	XV	Tignamar	-18.57662	-69.50507	3184	18.iv	1.v.2013	J. Postlethwaite & S. Monckton		PCYU
C. dolator	M	XV	Tignamar	-18.57662	-69.50507	3184	18.iv	1.v.2013	J. Postlethwaite & S. Monckton		PCYU
C. dolator	M	XV	S of Pucará Belén, Hwy A-31, km 132	-18.49130	-69.52111	3108	28.xi.2013		J. Postlethwaite & S. Monckton		PCYU
C. dolator	F	XV	S of Pucará Belén, Hwy A-31, km 132	-18.49130	-69.52111	3108	28.xi.2013		J. Postlethwaite & S. Monckton		PCYU
C. dolator	M	XV	Tojo Tojone	-18.48553	-69.52830	3151	28.xi.2014		J Postlethwaite		PCYU
C. dolator	F	XV	Tojo Tojone	-18.48553	-69.52830	3151	28.xi.2014		J Postlethwaite		PCYU
C. dolator	M	XV	Pucara Belen, Hwy A-31, km 136	-18.47507	-69.52806	3124	1.xi.2013		J Postlethwaite		PCYU
C. dolator	M	XV	Pucará Belén, Hwy A-31	-18.47290	-69.52797	3129	1.xi.2013		S. Monckton		PCYU
C. dolator	M	XV	Pucará Belén, Hwy A-31	-18.47290	-69.52797	3129	1.xi.2013		S. Monckton		PCYU
C. dolator	M	XV	Quebrada Cardones	-18.45698	-69.77264	2378	17.iv.2012		L. Packer		PCYU
C. dolator	F	XV	Hwy 11m 74.5km	-18.44759	-69.76234	2443	17.iv.2012		L. Packer	CCDB-15274 C01	PCYU
C. dolator	F	XV	Hwy CH-11, marker 7552332	-18.44258	-69.75993	2519	3.ii	21.iv.2013	J. Postlethwaite & S. Monckton		PCYU
C. dolator	F	XV	Hwy CH-11, marker 7552332	-18.44258	-69.75993	2519	3.ii	21.iv.2013	J. Postlethwaite & S. Monckton		PCYU
C. dolator	F	XV	Hwy CH-11, marker 7552332	-18.44258	-69.75993	2519	3.ii	21.iv.2013	J. Postlethwaite & S. Monckton		PCYU
C. dolator	F	XV	Hwy CH-11, marker 7552332	-18.44258	-69.75993	2519	3.ii	21.iv.2013	J. Postlethwaite & S. Monckton		PCYU
C. dolator	F	XV	Hwy CH-11, marker 7552332	-18.44258	-69.75993	2519	3.ii	21.iv.2013	J. Postlethwaite & S. Monckton		PCYU
C. dolator	F	XV	Hwy CH-11, marker 7552332	-18.44258	-69.75993	2519	21.iv.2013	30.iv.2013	J. Postlethwaite & S. Monckton		PCYU
C. dolator	M	XV	Hwy CH-11, marker 7552332	-18.44258	-69.75993	2519	3.ii	21.iv.2013	J. Postlethwaite & S. Monckton		PCYU
C. dolator	F	XV	CH-11 km 57, Borax plant	-18.44213	-69.89244	1638	21.iv	30.iv.2013	J. Postlethwaite & S. Monckton		PCYU
C. dolator	F	XV	E. of Arica, Hwy CH-11	-18.43778	-69.74077	2983	8.xii.2014		L. Packer		PCYU
C. dolator	M	XV	E. of Arica, Hwy CH-11	-18.43778	-69.74077	2983	8.xii.2014		L. Packer		PCYU
C. dolator	M	XV	E. of Arica, Hwy CH-11	-18.43778	-69.74077	2983	8.xii.2014		L. Packer		PCYU
C. dolator	M	XV	E. of Arica, Hwy CH-11	-18.43778	-69.74077	2983	8.xii.2014		L. Packer		PCYU
C. dolator	M	XV	E. of Arica, Hwy CH-11	-18.43778	-69.74077	2983	8.xii.2014		L. Packer		PCYU
C. dolator	F	XV	N. of Belen, Hwy A-31	-18.42251	-69.50607	3694	9.xii.2014		L. Packer		PCYU
C. dolator	M	XV	N. of Belen, Hwy A-31	-18.42251	-69.50607	3694	9.xii.2014		L. Packer		PCYU
C. dolator	M	XV	Hwy CH-11, Quebrada Cardones	-18.41389	-69.66959	2999	3.ii	21.iv.2013	J. Postlethwaite & S. Monckton		PCYU
C. dolator	F	XV	Hwy CH-11, Quebrada Cardones	-18.41389	-69.66959	2999	1.iv	30.iv.2013	J. Postlethwaite & S. Monckton		PCYU
C. dolator	F	XV	Hwy CH-11, Quebrada Cardones	-18.41389	-69.66959	2999	3.ii	21.iv.2013	J. Postlethwaite & S. Monckton		PCYU
C. dolator	F	XV	Hwy CH-11, Quebrada Cardones	-18.41389	-69.66959	2999	1.iv	31.iv	J. Postlethwaite & S. Monckton		PCYU
C. dolator	M	XV	Hwy A-31, N. of Chapiquiña	-18.38227	-69.54929	3324	1.ii.2013		J Postlethwaite		PCYU
C. dolator	F	XV	S. of Murmuntani	-18.37001	-69.55502	3437	20.iv	29.iv.2013	J. Postlethwaite & S. Monckton		PCYU
C. dolator	M	XV	S. of Murmuntani	-18.37001	-69.55502	3437	20.iv	29.iv.2013	J. Postlethwaite & S. Monckton		PCYU

C. dolator	M	XV	Circuito de las Misiones km 164	-18.35633	-69.54819	3585	1.xi.2013		J. Postlethwaite & S. Monckton		PCYU
C. dolator	F	XV	Tambo	-18.35379	-69.61935	3237	17.iv.2012		L. Packer	CCDB-15274 A10	PCYU
C. dolator	F	XV	Murmuntani	-18.34999	-69.55273	3538	20.iv	29.iv.2013	J. Postlethwaite & S. Monckton	CCDB-22790 H06	PCYU
C. dolator	F	XV	Murmuntani	-18.34999	-69.55273	3538	20.iv	29.iv.2013	J. Postlethwaite & S. Monckton		PCYU
C. dolator	F	XV	Murmuntani	-18.34999	-69.55273	3538	20.iv	29.iv.2013	J. Postlethwaite & S. Monckton		PCYU
C. dolator	F	XV	Murmuntani	-18.34999	-69.55273	3538	20.iv	29.iv.2013	J. Postlethwaite & S. Monckton		PCYU
C. dolator	M	XV	Murmuntani	-18.34999	-69.55273	3538	29.xi.2013		J Postlethwaite		PCYU
C. dolator	F	XV	Murmuntani	-18.34999	-69.55273	3538	29.xi.2013		J Postlethwaite		PCYU
C. dolator	F	XV	Puente Murmuntani	-18.34600	-69.55200	3565	13.iv.2004		L. Packer	B10040-C1	PCYU
C. dolator	F	XV	Puente Murmuntani	-18.34600	-69.55200	3565	13.iv.2004		L. Packer		PCYU
C. dolator	F	XV	Puente Murmuntani	-18.34600	-69.55200		8.iv.2000		L. Packer		PCYU
C. dolator	F	XV	Zapahuira	-18.34174	-69.59572	329		17.iv.2012	L. Packer		PCYU
C. dolator	F	XV	CH-11, N of Zaphuria	-18.32212	-69.59515	3357	29.xi.2014		J Postlethwaite		PCYU
C. dolator	M	XV	CH-11, N of Zaphuria	-18.32212	-69.59515	3357	29.xi.2014		J Postlethwaite		PCYU
C. dolator	F	XV	CH-11 N. of Zapuria	-18.31501	-69.59683	3414	22.iv	29.iv.2013	J. Postlethwaite & S. Monckton		PCYU
C. dolator	F	XV	CH-11 N. of Zapuria	-18.31501	-69.59683	3414	22.iv	29.iv.2013	J. Postlethwaite & S. Monckton		PCYU
C. dolator	F	XV	CH-11 N. of Zapuria	-18.31501	-69.59683	3414	22.iv	29.iv.2013	J. Postlethwaite & S. Monckton		PCYU
C. dolator	F	XV	CH-11 N. of Zapuria	-18.31501	-69.59683	3414	22.iv	29.iv.2013	J. Postlethwaite & S. Monckton		PCYU
C. dolator	F	XV	Tambo, 4km W. of Zapahuira	-18.30000	-69.60000		4.iv.2000		L. Packer	B09997-B4	PCYU
C. dolator	M	XV	Tambo, W. of Zapahuira	-18.30000	-69.60000	3240	12.iv.2004		L. Packer		PCYU
C. dolator	F	XV	Tambo, W. of Zapahuira	-18.30000	-69.60000	3240	12.iv.2004		L. Packer		PCYU
C. dolator	M	XV	CH-11 km 114.5	-18.24954	-69.56012	3501	3.ii	21.iv.2013	J. Postlethwaite & S. Monckton		PCYU
C. dolator	F	XV	CH-11 km 114.5	-18.24954	-69.56012	3501	3ii	21.iv.2013	J. Postlethwaite & S. Monckton		PCYU
C. dolator	F	XV	CH-11 km 114.5	-18.24954	-69.56012	3501	3.ii	21.iv.2013	J. Postlethwaite & S. Monckton		PCYU
C. dolator	F	XV	CH-11 km 114.5	-18.24954	-69.56012	3501	3.ii	21.iv.2013	J. Postlethwaite & S. Monckton		PCYU
C. dolator	F	XV	CH-11 km 114.5	-18.24954	-69.56012	3501	3.ii	21.iv.2013	J. Postlethwaite & S. Monckton		PCYU
C. dolator	F	XV	Termas de Jurasi	-18.20402	-69.52802	3907	19.iv	29.iv.2013	J. Postlethwaite & S. Monckton		PCYU
C. dolator	F	XV	A-23, N. of Putre	-18.01853	-69.57982	4004	2.ii	19.iv.2013	J. Postlethwaite & S. Monckton		PCYU
C. dolator	M		Hwy A-31, km 91	-18.65745	-69.53724	3447	31.x	30.xi.2013	J. Postlethwaite & S. Monckton	CCDB-22790 G08	PCYU
C. dolator	F		A-31 S. of Tignamar	-18.58681	-69.52354	3392	18.iv	1.v.2013	J. Postlethwaite & S. Monckton		PCYU
C. rostraticeps	F	II	Ruta 5, km 1083.5	-25.65210	-70.36272	761	14.i	7.ii.2013	J. Postlethwaite & S. Monckton		PCYU
C. rostraticeps	F	II	Ruta 1, km 1	-25.55457	-70.35962	739	17.xi.2013		J. Postlethwaite & S. Monckton		PCYU
C. rostraticeps	M	II	Ruta 5, km 1144.5	-25.41652	-69.98257	1483	31.iii	5.v.2013	J. Postlethwaite & S. Monckton		PCYU
C. rostraticeps	F	II	Rd. to Salar Aguas Calientes, km 51.5	-25.37906	-69.38865	3024	27.ix	17.xi.2013	J. Postlethwaite & S. Monckton		PCYU
C. rostraticeps	F	II	N. of Taltal	-25.37000	-70.45000		20.xi.2002		J. Grixti & A. Zayed		PCYU
C. rostraticeps	F	II	N. of Taltal	-25.37000	-70.45000		20.xi.2002		J. Grixti & A. Zayed	B10040-C2	PCYU
C. rostraticeps	M	II	13km S. of Paposo	-25.11000	-70.48000		29.ix	4.x.2002	J. Grixti & A. Zayed		PCYU
C. rostraticeps	F	II	Cuesta Paposo	-25.01861	-70.42714	676	5.xi.2013		S. Monckton		PCYU
C. rostraticeps	F	II	Cuesta Paposo	-25.01861	-70.42714	676	5.xi.2013		S. Monckton		PCYU
C. rostraticeps	M	II	7km N of Paposo	-24.99800	-70.46600		20.xi.2002		J. Grixti & A. Zayed		PCYU
C. rostraticeps	M	II	5 km N. of Paposo	-24.99800	-70.46600		25.x.2000		L. Packer		PCYU
C. rostraticeps	M	II	7 km N. of Paposo	-24.98000	-70.47000		14.xi.2002		J. Grixti & A. Zayed		PCYU
C. rostraticeps	F	II	7 km N. of Paposo	-24.98000	-70.47000		14.xi.2002		J. Grixti & A. Zayed		PCYU
C. rostraticeps	F	II	7 km N. of Paposo	-24.98000	-70.47000		14.xi.2002		J. Grixti & A. Zayed		PCYU
C. rostraticeps	M	II	7 km N. of Paposo	-24.98000	-70.47000		14.xi.2002		J. Grixti & A. Zayed		PCYU
C. rostraticeps	M	II	7 km N. of Paposo	-24.98000	-70.47000		20.xi.2002		J. Grixti & A. Zayed		PCYU
C. rostraticeps	M	II	7 km N. of Paposo	-24.98000	-70.47000		20.xi.2002		J. Grixti & A. Zayed		PCYU
C. rostraticeps	F	II	7 km N. of Paposo	-24.98000	-70.47000		20.xi.2002		J. Grixti & A. Zayed		PCYU
C. rostraticeps	F	II	7 km N. of Paposo	-24.98000	-70.47000		20.xi.2002		J. Grixti & A. Zayed		PCYU

C. rostraticeps	F	II	Ruta 1, km 89, N. of Paposo	-24.89951	-70.52556	35	5.ii	25.iv.2013	J. Postlethwaite & S. Monckton		PCYU
C. rostraticeps	F	II	Ruta 1, km 89, N. of Paposo	-24.89951	-70.52556	35	5.ii	25.iv.2013	J. Postlethwaite & S. Monckton	CCDB-22014 D09	PCYU
C. rostraticeps	F	III	Caleta Apolillado	-29.18260	-71.48815	18	8.xi	13.xii.2013	J. Postlethwaite & S. Monckton		PCYU
C. rostraticeps	M	III	Caleta Apolillado	-29.18260	-71.48815	18	13.xii.2013		J. Postlethwaite & S. Monckton		PCYU
C. rostraticeps	M	III	Caleta Apolillado	-29.18260	-71.48815	18	13.xii.2013		J. Postlethwaite & S. Monckton		PCYU
C. rostraticeps	F	III	Caleta Carrizalillo	-29.10981	-71.46130	11	8.xi	13.xii.2013	J. Postlethwaite & S. Monckton		PCYU
C. rostraticeps	F	III	Caleta Carrizalillo	-29.10981	-71.46130	11	8.xi	13.xii.2013	J. Postlethwaite & S. Monckton		PCYU
C. rostraticeps	F	III	Caleta Carrizalillo	-29.10981	-71.46130	11	13.x	8.xi.2013	J. Postlethwaite & S. Monckton		PCYU
C. rostraticeps	F	III	Caleta Carrizalillo	-29.10981	-71.46130	11	13.x	8.xi.2013	J. Postlethwaite & S. Monckton		PCYU
C. rostraticeps	M	III	Chañaral de Aceituno	-29.07847	-71.48491	24	9.ii	23.iv.2013	J. Postlethwaite & S. Monckton		PCYU
C. rostraticeps	F	III	Cachiyuyo	-29.03290	-70.30180		20.x.2009		J. Gibbs		PCYU
C. rostraticeps	F	III	Chañar de Aceituno	-29.02400	-71.40400		20.ix.2003		A. Ugarte		PCYU
C. rostraticeps	F	III	Chañar de Aceituno	-29.02400	-71.40400		20.ix.2003		A. Ugarte		PCYU
C. rostraticeps	F	III	Chañar de Aceituno	-29.02400	-71.40400		20.ix.2003		A. Ugarte		PCYU
C. rostraticeps	F	III	Chañar de Aceituno	-29.02400	-71.40400		18.ix.2003		A. Ugarte		PCYU
C. rostraticeps	F	III	Chañar de Aceituno	-29.02400	-71.40400		18.ix.2004		A. Ugarte		PCYU
C. rostraticeps	F	III	Chañar de Aceituno	-29.02400	-71.40400		18.ix.2005		A. Ugarte		PCYU
C. rostraticeps	F	III	Chañar de Aceituno	-29.02400	-71.40400		20.ix.2003		A. Ugarte		PCYU
C. rostraticeps	M	III	7.3km W. of Domeyko	-28.97834	-70.96402	648	22.x.2010		L Packer & E Almeida		PCYU
C. rostraticeps	F	III	Rio Conay, km 50	-28.97404	-70.17121	1399	15.x.2013		S. Monckton		PCYU
C. rostraticeps	M	III	W. of Domeyko	-28.97208	-71.00058	610	5.x.2010		L Packer & GS Fraser		PCYU
C. rostraticeps	M	III	W. of Domeyko	-28.94208	-71.00058		5.v.2010		L Packer & GS Fraser	B10006-C08	PCYU
C. rostraticeps	F	III	Chuingo	-28.82510	-70.35596	963	15.ix.2010		L. Packer	B09857-D04	PCYU
C. rostraticeps	F	III	S. of Freirina	-28.54416	-71.05366	274	14.ix.2010		L. Packer	B09866-E03	PCYU
C. rostraticeps	M	III	Santa Juana, E. of Vallenar	-28.54000	-71.05000		19.x.2000		L. Packer		PCYU
C. rostraticeps	F	III	Santa Juana, E. of Vallenar	-28.54000	-71.05000		19.x.2000		L. Packer		PCYU
C. rostraticeps	M	III	N. of Vallenar	-28.50000	-70.70000		11.x.2000	12.x.2000	L. Packer		PCYU
C. rostraticeps	M	III	N. of Vallenar	-28.50000	-70.70000		11.x.2000	12.x.2000	L. Packer		PCYU
C. rostraticeps	M	III	N. of Vallenar	-28.50000	-70.70000		11.x.2000	12.x.2000	L. Packer		PCYU
C. rostraticeps	M	III	Ruta 5, km 683. N. of Vallenar	-28.49000	-70.74000		17.x.2000		L. Packer		PCYU
C. rostraticeps	M	III	Ruta 5, km 683. N. of Vallenar	-28.49000	-70.74000		28.xi.2002		J. Grixti & A. Zayed		PCYU
C. rostraticeps	M	III	Ruta 5, km 683. N. of Vallenar	-28.49000	-70.74000		17.x.2000		L. Packer		PCYU
C. rostraticeps	M	III	0.2km E of Huasco	-28.46600	-71.20470		19.x.2009		J. Gibbs	CCDB-06729 E05	PCYU
C. rostraticeps	F	III	El Barratillo, N. of Huasco	-28.40000	-71.20000		13.x.2000		L. Packer		PCYU
C. rostraticeps	M	III	El Barratillo, N. of Huasco	-28.40000	-71.20000		13.x.2000		L. Packer		PCYU
C. rostraticeps	F	III	El Barratillo, N. of Huasco	-28.40000	-71.20000		13.x.2000		L. Packer		PCYU
C. rostraticeps	F	III	N of Huasco, km 11	-28.38215	-71.16250	86	19.x	7.xi.2013	J. Postlethwaite & S. Monckton	CCDB-22790 H07	PCYU
C. rostraticeps	F	III	N of Huasco, km 18	-28.32476	-71.15281	62	14.x	7.xi.2013	J. Postlethwaite & S. Monckton		PCYU
C. rostraticeps	F	III	N of Huasco, km 18	-28.32476	-71.15281	62	14.x	7.xi.2013	J. Postlethwaite & S. Monckton		PCYU
C. rostraticeps	F	III	N of Huasco, km 18	-28.32476	-71.15281	62	14.x	7.xi.2013	J. Postlethwaite & S. Monckton		PCYU
C. rostraticeps	F	III	N of Huasco, km 18	-28.32476	-71.15281	62	14.x	7.xi.2013	J. Postlethwaite & S. Monckton		PCYU
C. rostraticeps	F	III	N of Huasco, km 18	-28.32476	-71.15281	62	14.x	7.xi.2013	J. Postlethwaite & S. Monckton		PCYU
C. rostraticeps	F	III	N of Huasco, km 18	-28.32476	-71.15281	62	14.x	7.xi.2013	J. Postlethwaite & S. Monckton		PCYU
C. rostraticeps	F	III	Rd. to La Semilla, C-493, km 7	-28.22434	-69.76015	2125	6.xi	10.xii	J. Postlethwaite & S. Monckton		PCYU
C. rostraticeps	F	III	Parque Nacional Llanos de Challe	-28.21000	-71.15000		22.x.2000		L. Packer		PCYU
C. rostraticeps	F	III	Parque Nacional Llanos de Challe	-28.21000	-71.15000		22.x.2000		L. Packer		PCYU
C. rostraticeps	M	III	Parque Nacional Llanos de Challe	-28.21000	-71.15000		22.x.2000		L. Packer		PCYU
C. rostraticeps	M	III	Posada Elsa, N of Vallenar	-28.15000	-70.63000		11.x.2000		L. Packer		PCYU
C. rostraticeps	M	III	Posada Elsa, N of Vallenar	-28.15000	-70.63000		11.x.2000		L. Packer		PCYU

C. rostraticeps	F	III	N of Huasco, km 39	-28.14721	-71.15618	37	14.x	7.xi.2013	J. Postlethwaite & S. Monckton		PCYU
C. rostraticeps	F	III	N. of Huasco, km 39	-28.14721	-71.15618	37	7.xi.2013		S. Monckton		PCYU
C. rostraticeps	F	III	N. of Huasco, km 39	-28.14721	-71.15618	37	7.xi.2013		S. Monckton		PCYU
C. rostraticeps	F	III	N of Huasco, km 52	-28.04383	-71.12875	65	14.x	7.xi.2013	J. Postlethwaite & S. Monckton		PCYU
C. rostraticeps	M	III	N of Huasco, km 52	-28.04383	-71.12875	65	14.x	7.xi.2013	J. Postlethwaite & S. Monckton		PCYU
C. rostraticeps	M	III	Travesia, S. of Copiapo	-27.54100	-70.44200		23.x.2000		L. Packer		PCYU
C. rostraticeps	F	III	Travesia, S. of Copiapo	-27.54100	-70.44200		23.x.2000		L. Packer		PCYU
C. rostraticeps	F	III	Travesia, S. of Copiapo	-27.54100	-70.44200		23.x.2000		L. Packer		PCYU
C. rostraticeps	M	III	Hwy 5, km 848	-27.34470	-70.69310		18.x.2009		J. Gibbs		PCYU
C. rostraticeps	M	III	Hwy 5, km 848	-27.34470	-70.69310		16.x.2009		J. Gibbs		PCYU
C. rostraticeps	M	III	Hwy 5, km 848	-27.34470	-70.69310		16.x.2009		J. Gibbs	CCDB-06729 B06	PCYU
C. rostraticeps	F	III	Caldera	-27.06306	-70.81092	13	17.x	30.xi.2014	J Postlethwaite		PCYU
C. rostraticeps	M	III	Caldera	-27.06306	-70.81092	13	17.x	30.xi.2014	J Postlethwaite		PCYU
C. rostraticeps	F	III	Caldera	-27.06306	-70.81092	13	17.x	30.xi.2014	J Postlethwaite		PCYU
C. rostraticeps	F	III	Caldera	-27.06306	-70.81092	13	17.x	30.xi.2014	J Postlethwaite		PCYU
C. rostraticeps	M	III	Caldera	-27.05709	-70.80511	16	17.x	30.xi.2014	J Postlethwaite		PCYU
C. rostraticeps	F	III	Caldera	-27.05709	-70.80511	16	17.x	30.xi.2014	J Postlethwaite		PCYU
C. rostraticeps	F	III	Caldera	-27.05709	-70.80511	16	17.x	30.xi.2014	J Postlethwaite		PCYU
C. rostraticeps	M	III	Caldera	-27.05709	-70.80511	16	17.x	30.xi.2014	J Postlethwaite		PCYU
C. rostraticeps	M	III	Caldera	-27.05709	-70.80511	16	17.x	30.xi.2014	J Postlethwaite		PCYU
C. rostraticeps	M	III	Caldera	-27.05709	-70.80511	16	17.x	30.xi.2014	J Postlethwaite		PCYU
C. rostraticeps	M	III	Caldera	-27.05709	-70.80511	16	17.x	30.xi.2014	J Postlethwaite		PCYU
C. rostraticeps	M	III	Caldera	-27.05709	-70.80511	16	17.x	30.xi.2014	J Postlethwaite		PCYU
C. rostraticeps	M	III	Caldera	-27.05709	-70.80511	16	17.x	30.xi.2014	J Postlethwaite		PCYU
C. rostraticeps	M	III	Caldera	-27.05709	-70.80511	16	17.x	30.xi.2014	J Postlethwaite		PCYU
C. rostraticeps	F	III	Pesquera Bahía Caldera SA	-27.05413	-70.80428	-8!	6.xi	15.xi	J. Postlethwaite & S. Monckton		PCYU
C. rostraticeps	F	III	S. of D. de Almagro. C-17 km 47	-27.00993	-69.89824	1734	25.iv	5.v.2013			PCYU
C. rostraticeps	F	III	S. of D. de Almagro. C-17 km 62.2	-26.88441	-69.91528	1873	25.iv	5.v.2013			PCYU
C. rostraticeps	F	III	S. of Chañaral, Ruta 5 marker 930.320	-26.66496	-70.71722	21	7.iv	24.iv.2013	J. Postlethwaite & S. Monckton		PCYU
C. rostraticeps	F	III	C- 13, km 24	-26.45853	-69.32718	2839	28.ix	16.xi.2013	J. Postlethwaite & S. Monckton		PCYU
C. rostraticeps	F	III	C- 13, km 24	-26.45853	-69.32718	2839	28.ix	16.xi.2013	J. Postlethwaite & S. Monckton		PCYU
C. rostraticeps	F	III	W. of Diego de Almagro	-26.43276	-70.24438	504	7.ii	28.iii.2013	J. Postlethwaite & S. Monckton		PCYU
C. rostraticeps	M	III	20 km W. of Diego de Almagro	-26.43000	-70.24000		10.xi.2001		L. Packer		PCYU
C. rostraticeps	F	III	20 km W. of Diego de Almagro	-26.43000	-70.24000		10.xi.2001		L. Packer		PCYU
C. rostraticeps	F	III	Hwy C-13, S. of Agua Dulce	-26.40008	-69.56183	2001	7.ii	28.iii.2013	J. Postlethwaite & S. Monckton		PCYU
C. rostraticeps	F	III	Hwy C-13, S. of Agua Dulce	-26.40008	-69.56183	2001	28.iii	24.iv.2013	J. Postlethwaite & S. Monckton		PCYU
C. rostraticeps	F	III	Hwy C-13, S. of Agua Dulce	-26.40008	-69.56183	2001	7.ii	28.iii.2013	J. Postlethwaite & S. Monckton		PCYU
C. rostraticeps	F	III	Chañaral	-26.35000	-70.63000		13.xi.1997		L. Packer		PCYU
C. rostraticeps	F	III	E. of Chañaral. Pan Am, km 1012-17	-26.33000	-70.44000		10.x.2001		Packer & Fraser		PCYU
C. rostraticeps	F	IV	Punta de Lobos	-31.94858	-71.52464	15	11.x.2013		S. Monckton		PCYU
C. rostraticeps	F	IV	Punta de Lobos	-31.94858	-71.52464	15	11.x.2013		S. Monckton		PCYU
C. rostraticeps	F	IV	Punta de Lobos	-31.94858	-71.52464	15	10.x.2010		L. Packer		PCYU
C. rostraticeps	F	IV	Punta de Lobos	-31.94858	-71.52464	15	10.x.2010		L. Packer		PCYU
C. rostraticeps	F	IV	Coast, S. of Los Vilos	-31.93100	-71.51349	8	10.xi.2013		S. Monckton		PCYU
C. rostraticeps	F	IV	Los Vilos, Puente Mata Gorda	-31.90375	-71.48987	55	16.xii.2013		J. Postlethwaite & S. Monckton		PCYU
C. rostraticeps	F	IV	Parque Nacional Fray Jorge	-30.67000	-71.65000		15.iv.2000		L. Packer		PCYU
C. rostraticeps	M	IV	Parque Nacional Fray Jorge	-30.67000	-71.65000		15.iv.2000		L. Packer		PCYU
C. rostraticeps	F	IV	16.5km E of Fray Jorge	-30.59530	-71.59480		10.x.2009		J. Gibbs	CCDB-06729 C11	PCYU
C. rostraticeps	M	IV	S of Tongoy, R-440 km 5	-30.32008	-71.46635	124	18.x.2013		S. Monckton		PCYU

C. rostraticeps	F	IV	S of Tongoy, R-440 km 5	-30.32008	-71.46635	124	18.x.2013		S. Monckton	CCDB-22015 G04	PCYU
C. rostraticeps	F	IV	1.1 km S on rd. to Tololo	-30.30580	-70.81510		11.x	22.x.2009	J. Gibbs		PCYU
C. rostraticeps	F	IV	Puerto Aldea nr. Tongoy	-30.30000	-71.60000		26.x.2001		L Packer & GS Fraser		PCYU
C. rostraticeps	F	IV	Chañar-Los Lavadores	-30.29630	-70.62728	1396	10.xi.2010		L. Packer	B09866-E12	PCYU
C. rostraticeps	M	IV	Chañar-Los Lavadores	-30.29630	-70.62728	1396	10.xi.2010		L. Packer	B09866-F05	PCYU
C. rostraticeps	F	IV	Chañar	-30.28650	-70.63380		11.x.2009		J. Gibbs	CCDB-06729 H04	PCYU
C. rostraticeps	M	IV	Chañar	-30.28650	-70.63380		11.x.2009		J. Gibbs	CCDB-06729 H06	PCYU
C. rostraticeps	F	IV	S. of Vicuña	-30.28000	-70.64000		11.ix	30.ix.2004	unknown		PCYU
C. rostraticeps	F	IV	N. of Hurtado	-30.26655	-70.66051	1330	16.x.2013		S. Monckton		PCYU
C. rostraticeps	F	IV	N. of Hurtado	-30.26655	-70.66051	1330	16.x.2013		S. Monckton		PCYU
C. rostraticeps	F	IV	W. of Guanaqueros	-30.24076	-71.44662	67	18.x.2013		S. Monckton		PCYU
C. rostraticeps	F	IV	W. of Guanaqueros	-30.24076	-71.44662	67	18.x.2013		S. Monckton		PCYU
C. rostraticeps	M	IV	W. of Guanaqueros	-30.24076	-71.44662	67	18.x.2013		S. Monckton		PCYU
C. rostraticeps	F	IV	Rd. to Playa Blanca	-30.22739	-71.45116	143	18.x.2013		S. Monckton		PCYU
C. rostraticeps	M	IV	Rd. to Playa Blanca	-30.22739	-71.45116	143	18.x.2013		S. Monckton		PCYU
C. rostraticeps	F	IV	10 km S. of Vicuña	-30.20000	-70.70000		15.xi.2002		J. Grixti & A. Zayed		PCYU
C. rostraticeps	M	IV	Nr Tongoy Camping	-30.16000	-71.30000		14.xi.2002		J. Grixti & A. Zayed		PCYU
C. rostraticeps	F	IV	Nr Tongoy Camping	-30.16000	-71.30000		14.xi.2002		J. Grixti & A. Zayed		PCYU
C. rostraticeps	F	IV	S. of Vicuña	-30.15000	-70.66000		11.ix	30.ix.2004	unknown		PCYU
C. rostraticeps	F	IV	6km S. of Vicuña	-30.10000	-70.71000		15.x.2000		L. Packer		PCYU
C. rostraticeps	M	IV	6km S. of Vicuña	-30.10000	-70.71000		15.x.2000		L. Packer		PCYU
C. rostraticeps	F	IV	41-CH, km 137.8	-29.96704	-70.19362	1800	16.x	14.xii.2013	J. Postlethwaite & S. Monckton		PCYU
C. rostraticeps	F	IV	Caleta Los Hornos, S. of La Higuera	-29.62000	-71.29000		11.xi.1997		L. Packer		PCYU
C. rostraticeps	M	IV	2 km N. La Higuera	-29.49000	-71.22000		16.xi.2002		J. Grixti & A. Zayed		PCYU
C. rostraticeps	M	IV	Hwy to Choros Bajos, pole #101	-29.31152	-71.26279	197	9.ii	23.iv.2013	J. Postlethwaite & S. Monckton		PCYU
C. rostraticeps	F	IV	Hwy to Choros Bajos, pole #102	-29.31152	-71.26279	197	9.ii	23.iv.2013	J. Postlethwaite & S. Monckton		PCYU
C. rostraticeps	F	IV	Los Choros	-29.24000	-71.46000		25.x.2002		J. Grixti & A. Zayed		PCYU
C. rostraticeps	F	IV	N of Punta de Choros, km 2.5	-29.22087	-71.46234	24	8.xi	13.xii.2013	J. Postlethwaite & S. Monckton		PCYU
C. rostraticeps	M	RM	Termas Valle de Colina	-33.85600	-69.98037	2527	7.i.2009		L. Packer		PCYU
C. rostraticeps	F	RM	E. of El Volcan	-33.82824	-70.04365	1963	15.ii	22.iii.2013	J. Postlethwaite & S. Monckton	CCDB-22790 H03	PCYU
C. rostraticeps	F	RM	W. of El Volcan	-33.81453	-70.18598	1411	7.i.2009		L. Packer		PCYU
C. rostraticeps	M	RM	Farellones	-33.35627	-70.32478	2179	9.i.2009		L. Packer		PCYU
C. rostraticeps	M	RM	Farellones	-33.35627	-70.32478	2179	9.i.2009		L. Packer		PCYU
C. rostraticeps	F	RM	Farellones	-33.34330	-70.34432	1650	2.v.2010		L Packer & GS Fraser	B10006-A04	PCYU
C. rostraticeps	M	RM	Camino A Farellones	-33.32651	-70.32651	1865	18.ii.2015		L. Packer		PCYU
C. rostraticeps	M	RM	Farellones	-33.30000	-70.30000		9.xii.2006		L. Packer		PCYU
C. rostraticeps	F	RM	Santiago, Cuesta La Dormida	-33.07193	-70.97269	784	10.x.2013		S. Monckton		PCYU
C. rostraticeps	M	RM	km 12 Caleu	-32.99900	-70.97700		1.i.2009		L. Packer		PCYU
C. rostraticeps	M	RM	Cerro El Roble	-32.98202	-71.02115	1923	1.i.2009		L. Packer		PCYU
C. rostraticeps	M	RM	Cerro El Roble	-32.98202	-71.02115	1923	1.i.2009		L. Packer		PCYU
C. rostraticeps	F	RM	Cuna Gallego Valley	-32.88293	-70.13793	2280	10.i.2009		L. Packer		PCYU
C. rostraticeps	F	V	Rio Blanco E. of Los Andes, km 79.7	-32.90866	-70.30104	1436	6.xi	25.xi.2014	J Postlethwaite		PCYU
C. rostraticeps	M	V	E. of Los Andes	-32.86259	-70.17208	2162	3.iii.2015		L. Packer		PCYU
C. rostraticeps	M	V	E. of Los Andes	-32.86259	-70.17208	2162	3.iii.2015		L. Packer		PCYU

APPENDIX E: Localities mentioned in-text

1 Arica

2 Iquique

3 Palo Buque

4 Alto Patache

5 Calama

6 Antofagasta

7 Llullaillaco National Park

8 Paposo

9 Taltal

10 Chañaral

11 Copiapo

12 Fray Jorge National Park

Figure S22: Locations in northern Chile mentioned in-text. Scale bar = 150 km.