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NOTA CIENTÍFICA

THE UPDATE DISTRIBUTION OF THE ALIEN MUD-DAUBER WASP *SCELIPHRON CURVATUM* (SMITH, 1870) IN CHILE WITH NEW OCCURRENCE RECORDS (HYMENOPTERA: SPHECIDAE)

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ABSTRACT

Sceliphron curvatum (Smith, 1870) is a sphecid native to central and southern Asia which was accidentally introduced in various countries in the world and in the last decades was introduced also into South America. In this paper the knowledges of the its occurrence in the continent are summarized and new records for Chile of this alien mud-dauber wasp are reported. The material examined consists of photographed specimens or nests from the website iNaturalist and all listed records were confirmed by the author. *Sceliphron curvatum* is easily recognizable compared to the others species of *Sceliphron* of South America since it has reddish legs and gaster (petiole excluded) with reddish bands. Also the nest is easily recognizable from ones of the other South America species since it is not covered by a final thick layer of mud. The present work provides information which increases the knowledge of the distribution of this alien mud-dauber wasp in Chile. In addition to confirm the establishment in the Santiago Metropolitan Region, first occurrence records of the species are given for the regions of Antofagasta, Coquimbo, Valparaíso, Libertador General Bernardo O'Higgins, Maule, and Ñuble. The new occurrence records provided in this paper demonstrate the first widespread of this sphecid in a south american country; indeed so far its established populations were found only in northern Argentina and in central Chile. In this latter country *S. curvatum* is now spreading its range (it is not known whether with new introductions or not).

Key world: alien species; faunistics; introduction; Neotropical region; South America

RESUMEN

Actualización de la distribución de la exótica avispa alfarera *Sceliphron curvatum* (Smith, 1870) en Chile con nuevos registros de presencia (Hymenoptera: Sphecidae). *Sceliphron curvatum* (Smith, 1870) es un esfécido nativo del centro y sur de Asia que fue introducido accidentalmente en varios países del mundo y en las últimas décadas también en Sudamérica. En este trabajo se resumen los conocimientos sobre su presencia en el continente y se aportan nuevos registros para Chile de esta avispa alfarera exótica.El material examinado consiste en individuos o nidos fotografiados del sitio web iNaturalist y todos los registros listados fueron confirmados por el autor. *Sceliphron curvatum* es fácilmente reconocible en comparación con las otras especies de *Sceliphron* de Sudamérica ya que tiene patas rojizos y gáster (sin pecíolo) con bandas rojizas. También el nido es fácilmente reconocible de los de otras especies de Sudamérica ya que no está cubierto por una gruesa capa final de barro. El presente trabajo da información que aumenta el conocimiento de la distribución de esta avispa alfarera exótica en Chile. Además de confirmar el establecimiento en la Región Metropolitana de Santiago, se aportan los primeros registros de ocurrencia de la especie para las regiones de Antofagasta, Coquimbo, Valparaíso, Libertador General Bernardo O'Higgins, Maule y Ñuble.Los nuevos registros de ocurrencia aportados en este trabajo demuestran la primera distribución generalizada de este esfécido en un país sudamericano; de hecho, hasta ahora sus poblaciones establecidas se habían encontrado sólo en el norte de Argentina y en el centro de Chile. En este último país, *S. curvatum* está ahora extendiendo su rango (no se sabe si con nuevas introducciones o no).

Palabras clave: América del Sur; especie exótica; faunística; introducción; región neotropical

INTRODUCTION

The genus *Sceliphron* Klug, 1801 includes 34 species of mud-dauber wasps widespread in all continents except Antarctica (Pulawski 2024). Two species of this genus are native to South America, but in last decades further two species have been added due to the introduction by humans (Barrera-Medina & Sepúlveda-Osorio 2014). In Chile three species are known: the native *S. asiaticum* (Linnaeus, 1758) and the allochthonous *S. caementarium* (Drury, 1773) and *S. curvatum* (Smith, 1870) (Pulawski 2024).

The latter one is native to the mountainous areas of central and southern Asia (see Hensen 1987; Pulawski 2024). Accidental introductions have spread this sphecid in various country of the world and, as well as in South America, out of its native range currently *S. curvatum* is present in French Polynesia and widespread in many European and Mediterranean countries (see Pulawski 2024).

Its introduction in South America dates back to 2000s. The first interception was in 2001, when three males emerged from nests in Buenos Aires city (Compagnucci & Rog Alsina 2008). However, no occurrence was recorded in the following years and the introduction of the species seem to have been an isolated event, without this sphecid having been able to establish.

Subsequently in 2007, some specimens were found in Chile in the Santiago Metropolitan Region in different months and places, demonstrating a first real establishment of the species in South America (Barrera-Medina & Garcete-Barrett 2008). The following year, some specimens were found again in the Argentine capital as well as in the locality of La Lucila, in the province of Buenos Aires, revealing that this time the species has established in the Northeastern Argentina at least from 2007 (Compagnucci & Rog Alsina 2008).

No further records can be found in literature in South America e so far in the continent *S. curvatum* seems to be confined to these few populations in central Chile and northern Argentina, without expanding as quickly as *S. caementarium,* the other alien species introduced in the continent (see Ceccolini 2021, 2023a).

Anyway with the present contribution new records from several localities in Chile are given, demonstrating that the species is now spreading in this country.

MATERIAL AND METHODS

All material examined consists of photographed specimens or nests from the website iNaturalist. All listed records were confirmed by the author. *Sceliphron curvatum* is easily recognizable compared to the South America native species of *Sceliphron* and to the *S. caementarium*, since it has reddish legs and gaster (petiole excluded) with reddish bands (see Barrera-Medina & Garcete-Barrett 2008; Compagnucci & Rog Alsina 2008; Fernández & Castro-Huertas 2014; Ceccolini 2023b). Also the nest is easily recognizable from those of other species present in South America since the female attach each nest separately from the others in an exposed linear series of adjacent or separated brood cells (Gepp & Bregant 1986)—in the other South America species the brood cells of each nest form a more complex structure and are covered by a final thick layer of mud (Bohart & Menke 1976; Hensen 1987; Chatenoud *et al.* 2012).

In the material examined the following information is given: locality, coordinates, date, number of specimens, author of the photo, source. Geographical coordinates are in decimal degrees (datum WGS84). The uncertainty (abbreviated as un.) of data (in metres) is indicated according to the point-radius method (Wieczorek *et al.* 2004).

Material examined

Antofagasta Region: El Loa Province, San Pedro de Atacama, -22.91827°N -68.20476°E (un. = 423 m), 29.XI.2023, 1 specimen, photo by "lucasrojasr" Inaturalist (https://www.inaturalist.org/observations/192716446).

Coquimbo Region: Limarí Province, Monte Patria, near Escuela Nueva Esperanza de Pejerreyes, -31.02162°N -70.59162°E (un. = 15 m), 29.XI.2023, 1 specimen, photo by "rodcat13" (https://www.inaturalist.org/observations/192730156).

Valparaíso Region: San Felipe de Aconcagua Province, Putaendo, near Resguardo de los Patos, -32.50135°N -70.57515°E (un. = 418 m), 29.XII.2022, 1 specimen, photo by Tomás Román de la Fuente (https://www.inaturalist.org/observations/146034803).

Santiago Metropolitan Region Region: Santiago Province, Lo Barnechea, -33.32226°N -70.5406°E (un. = 1680 m), 30.XI.2023, 1 specimen, photo by Diego Montero (https://www.inaturalist.org/observations/192644636); *idem*, Huechuraba, -33.34169°N -70.66215°E (un. = 1610 m), 30.I.2024, 1 specimen, photo by Francisco Dávila (https://www.inaturalist.org/observations/197991914); *idem*, *idem*, near Valle de Elqui Street, -33.35889°N -70.68026°E, 22.XI.2023, 1 specimen (Figure 1), photo by Bryan Contreras (https://www.inaturalist.org/observations/191820754); Santiago de Chile, Barrio Suecia, -33.42051°N -70.60612°E (un. not recorded), 9.II.2024, 1 specimen, photo by Orlando Montes (https://www.inaturalist.org/observations/198893956); Ñuñoa, Ortúzar Street, -33.4493°N -70.58357°E, 27.X.2024, 1 specimen, photo by "mildred_ehrenfeld" (https://www.inaturalist.org/observations/250408764);



Figure 1. Specimen of *Sceliphron curvatum* from Valle de Elqui Street, Santiago Metropolitan Region (photo by Bryan Contreras).



Figure 2. Nests of *Sceliphron curvatum* from Quebrada Los Mineros, Libertador General Bernardo O'Higgins Region (photo by Alfonso Benítez-Mora).

idem, La Florida, -33.51916°N -70.59644°E (un. = 2790 m), 5.I.2019, 1 specimen, photo by "nicoleore" (https://www.inaturalist.org/observations/19479211); Talagante Province, Peñaflor, Parque Municipal El Trapiche de Peñaflor, -33.59704°N -70.8952°E (un. not recorded), 29.I.2022, 1 specimen, photo by Ariel Cabrera Foix (https://www.inaturalist.org/observations/105770710); Cordillera Province, Puente Alto, -33.56603°N -70.5469°E (un. = 1700 m), 22.II.2022, 4 nests (see Material and Methods since they are considered correspond to *S. curvatum*), photo by Katherine Huidobro (https://www.inaturalist.org/observations/107269230); *idem*, Pirque, near Avenida Virginia Subercaseaux, -33.64688°N - 70.60125°E (un. = 471 m), 25.II.2020, 1 specimen, photo by "claudia_sp" (https://www.inaturalist.org/observations/64851839).

Libertador General Bernardo O'Higgins Region: Cachapoal Province, San Vicente de Tagua Tagua, Los Altillos, -34.44277°N -71.04768°E (un. not recorded), 7.I.2024, 1 specimen, photo by Cristian Palominos (https://www.inaturalist.org/observations/196230331); Colchagua Province, Santa Cruz, Quebrada Los Mineros, -34.54785°N -71.25391°E (un. = 6 m), 8.X.2021, 7 nests (Figure 2) (see Material and Methods since they are considered correspond to *S. curvatum*), photo by Alfonso Benítez-Mora (https://www.inaturalist.org/observations/98192305).

Maule Region: Talca Province, San Clemente, Parque Natural Tricahue, -35.70291°N -71.07433°E (un. not recorded), 2.XII.2022, 1 specimen (Figure 3), photo by Ernesto Octavio Guzman Tapia (https://www.inaturalist.org/observations/143933856); Linares, Retiro, -35.82291°N -71.76928°E (un. = 2 m), 6.II.2015, 1 specimen, photo by Claudio Maureira (https://www.inaturalist.org/observations/34277540).

Ñuble **Region:** Diguillín Province, Chillán, near Av. Vicente Méndez, -36.5979°N -72.08897°E (un. = 45 m), 18.I.2024, 1 specimen, photo by Marcelo Hasbún-Roa (https://www.inaturalist.org/observations/235325288).



Figure 3. Specimen of *Sceliphron curvatum* from Parque Natural Tricahue, Talca (photo by Ernesto Octavio Guzman Tapia).

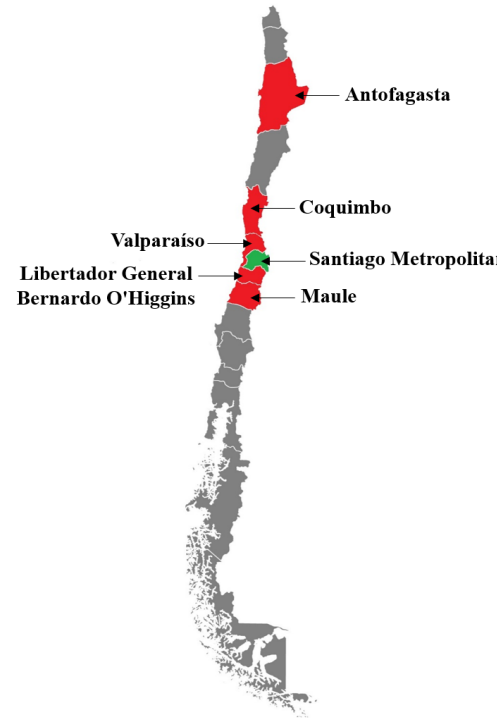


Figure 4. Update distribution of *S. curvatum* in Chile. Green = region where the species was known; red = regions where the species is recorded for the first time through the present work.

DISCUSSION

The present work provides information which increases the knowledge of the distribution of *S. curvatum* in Chile and demonstrate the first widespread of this sphecid in a south american country. In addition to confirm the establishment in the Santiago Metropolitan Region, first occurrence records of the species are given for the regions of Antofagasta, Coquimbo, Valparaíso, Libertador General Bernardo O'Higgins, Maule, and Ñuble. In the Figure 4 the update regional distribution of *S. curvatum* in Chile is summerized. Since this distribution it is hypothesized that the species is also present in the Atacama region, even if obviously this hypothesis needs to be confirm.

The ecological parameters that allowed this recent spread in Chile have not been analyzed; anyway, if compared how *S. curvatum* has expanded since its introduction in European countries with a Mediterranean climate (see Pulawski 2024), it can predict a future large spread even in Chile. In Chile another relative species, *S. caementarium*, was introduced in last decades (Barrera-Medina & Sepúlveda-Osorio, 2014), but so far it is it remained confined to a few regions (Ceccolini 2024). Anyway, in an other South American country, Peru (Ceccolini 2021, 2023a, 2024), after a failed acclimatization in the 1950s, recently *S. caementarium* is quickly spreading: it is not clear why there was no acclimatization the first time and there was the second time. Maybe alien *Sceliphron* populations can grow rapidly if they can reach a certain threshold; if so, *S. curvatum* seems to be reached the critical threshold in Chile and its future distribution in the country is destined to grow further.

Further researches will be needed to ascertain the future dynamics of the populations of *S. curvatum* in Chile and in general in South America to verify if this mud-dauber wasp will expand its range in the continent and if it can be an ecological competitor of the congeneric native species.

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