SCIENTIFIC NOTE

"From Freeze with Moths": First Discovery of a Habitat in Andean Salars for Noctuid Moths

Andrés O. Angulo[1], Andrés Camaño[2] and Gino A. Angulo[3]

[1]*Depto. Zoología, Facultad de Ciencias Naturales y Oceanográficas, Univ. Concepción, Casilla 160-C, Concepción Chile, aangulo@ udec.cl*
[2]*Minera La Escondida, II Región, Antofagasta, Chile;* [3]*Casilla 4040 Correo 3, Concepción, Chile*

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"Polillas del Frío": Primer Hallazgo de un Hábitat en Salares Andinos para Mariposas Nóctuidas

RESUMEN - Las polillas revolotean en las noches andinas a los 4000 m. s. n. m.; sus larvas se alimentan de las partes aéreas y subterráneas de las plantas suculentas. Muchas de estas especies son nuevas para la ciencia. Las estrategias y adaptaciones de las polillas para sobrevivir en los Andes son poseer un sistema circulatorio que incluye un sistema de contracorriente intercambiador de calor abdominal y torácico, y ellos se encuentran aislados del ambiente por una densa cubierta de escamas piliformes. Recientemente, durante Enero y Julio del 2004, en el norte desértico de Chile, en el Salar de Punta Negra, bajo costras de sal, donde se encontraron un gran número de pupas y larvas que corresponden a tres especies nuevas; su pupación está localizada a 10 m en una amplia área alrededor de un cuerpo de agua; la densidad media observada es de 13 a 15 pupas por 100 cm^2. Este es un nuevo hábitat extremo conquistado por los nóctuidos.

PALABRAS CLAVE: Lepidoptera, Noctuidae, hábitat extremo, Antofagasta, Chile

ABSTRACT - Noctuid moths flutter in the high Andes nights at 4,000 m. s. n. m. Their larvae feed on aerial or underground parts of succulent plants. Many of these species are new to science. Strategies and adaptations of the moths for survival in the high Andes mountains are: a circulatory system that includes an abdominal thoracic countercurrent heat exchanger, and they are insulated from the environment by a coat of dense hair like scales. Recently, during January and July 2004, in the northern desert of Chile, called Salar de Punta Negra, under the salt crust we found a large number of pupae and larvae that correspond to three new species of noctuid moth – this pupation site is located in a 10 m wide area surrounding a water body; the mean observed density is 13 to 15 pupae per 100 cm^2. This is a new extreme habitat conquered by noctuid moths.

KEY WORDS: Lepidoptera, Noctuidae, new extreme habitat, Antofagasta, Chile

Noctuid moths flutter in the high Andean nights at 4,000 m above sea level. They are effective pollinators of many plants and in turn are preyed upon by nocturnal insectivorous animals. Their larvae feed on aerial or underground parts of succulent plants. They are an important component of the high-Andean salar ecosystem. Many of these species are new to science, and usually belong to the Cucullinae subfamily.

Strategies and adaptations of the adult moths for living in the high Andes mountains are: a circulatory system that includes an abdominal thoracic countercurrent heat exchanger. Also they are insulated from the environment by a coat of dense hair like scales (modified scales); in addition, they begin to shiver at much lower temperatures than other moths of the same size (Heinrich 1987).

In the last week of January, the third week of July, and the last week of October 2004 a discovery was made in the northern desert of Chile, called Salar de Punta Negra (Fig.1) at UTM geographical coordinates: 7266830 N and 498388 E, at 2,968 m above sea level. Below freezing temperatures are common at this site along the year, even during summer. Under the salt crusts, we found a large number of noctuid moth pupae and larvae in their last stages of development (Fig. 2). The larvae and pupae correspond to three new species (description at press) and one known species, "greasy cutworm" *Agrotis ipsilon* Hufnagel (Lepidoptera: Noctuidae). The pupation site is located, around the water, within a 10-meter wide strip of land and no larvae or pupae were found beyond this area. The mean observed density is 13 to 15 pupae per 100 cm^2. The larvae feed on *Lycium*

Figure 1. General view of Salar de Punta Negra.

Figure 3. *L. humile*, a succulent Solanaceae plant in the border of the Salar.

Figure 2. Larvae and pupae under the salt crust.

Figure 4. Adult specimen of the new Noctuidae moth species (Lepidoptera: Noctuidae, Noctuinae).

humile Philippi, a Solanaceae succulent plant (Fig. 3). The adult moths (Fig. 4) fly at night, when the wind speed is low. Currently the oviposition sites are unknown, but we are continuing this study in a research project supported by Minera Escondida Limitada.

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Reference

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