GENERAL NOTE

First Remarks on Genetic Variation of the Little Known Leaf Miner Angelabella Tecomaevargas & Parra (Gracillariidae) in the Atacama Desert of Northern Chile

Additional key words: gene flow, micromoth, mitochondrial DNA, Oecophyllinae, population structure


The Atacama Desert is one of the oldest regions under continuously arid conditions and the most arid desert of the world (Clarke 2006). Accordingly, its native biota lives in extremely fragile and isolated environments (Pinto et al. 2006, Vargas & Moreira 2012, Carevic et al. 2013). In some cases the Atacama Desert has imposed a significant barrier to gene flow among isolated populations, generating high levels of intraspecific divergence (Baranzelli et al. 2014). The coastal valleys of northern Chile have been largely recognized among the most important places for the biodiversity of the Atacama Desert; however, these valleys are currently impacted by heavy anthropic pressures mostly associated with intensive agricultural activities. Pristine habitats have been greatly reduced throughout these valleys, giving rise to many threats for all the native biota (Luebert & Pliscoff 2006, Estades et al. 2007, Vargas & Parra 2009, Méndez-Abarca et al. 2012).

The Gracillariidae is a highly diverse plant-mining micromoth family, with 1,935 currently recognized species around the world (De Prins & De Prins 2014). Curiously, only a few more than 180 species have been described from the Neotropical Region until now (De Prins & De Prins 2014); however, this apparent low diversity is suggested to be an artifact arising from a poor sampling effort and a deficit of taxonomic descriptions for this fauna (Brito et al. 2012, Lees et al. 2014). The current knowledge of Chilean Gracillariidae is not an exception among the Neotropical representatives of this family, as only seven native species have been recorded (Davis 1994, Vargas & Landry 2005, Vargas & Parra 2005, De Prins & De Prins 2014, Mundaca et al. 2013a, b, Vargas et al. 2013).

Angelabella tecomaevargas & Parra, 2005 is a leaf miner gracillarid micromoth native to the coastal valleys of the Atacama Desert of southern Peru and northern Chile (Vargas & Parra 2005, Vargas 2010). Its primary host plant is the native shrub Tecoma fulvafa lava (Cav.) D. Don (Bignoniacae) (Vargas & Parra 2005), whose geographic range is also restricted to a small area of the Atacama Desert, including some valleys of southern Peru and northern Chile (Wood 2008). Females of A. tecoma select new leaflets of the host plant for egg laying (Storey-Palma et al. 2014); hatching occurs through the surface of the egg adhered to the leaflet; the first instar larva enters into the leaflet, where it remains throughout the larval and pupal stages (Storey-Palma et al. 2012). Accordingly, the active dispersal of A. tecoma is only in the adult stage, as larvae and pupae are strictly endophytic.

The life history traits of A. tecoma, together with the arid and highly human-modified environment, suggest the possibility of high genetic divergence among isolated populations; however, genetic studies dealing with populations of A. tecoma have not been performed.

Fig. 1. Sampling sites of Angelabella tecoma in Lluta Valley (square), Arica City (triangle), Arapa Valley (circle) in the Arica Province, northern Chilean Atacama Desert.