FIRST RECORD OF AN EXOTIC HOST PLANT FOR THE OLIGOPHAGOUS MOTH MACARIA MIRTHAE (GEOMETRIDAE) IN THE COASTAL VALLEYS OF THE NORTHERN CHILEAN ATACAMA DESERT

Additional key words: Acacia macracantha, folivorous, host shift, Leucaena leucocephala

Although many Lepidoptera species are highly specialized in the use of their hosts, some species are able to colonize exotic plants (Graves & Shapiro 2003, Bowers & Richardson 2013). In butterflies, this capacity may be predicted by the geographic range and the native diet breadth (Jahner et al. 2011). Native host range has also been mentioned as an important factor correlating with the use of exotic plants by geometrid moths (Fraser & Lawton 1994).

Host shifts have been acknowledged as extremely important for the survival of the populations of native butterflies in some human-modified environments (Shapiro 2002, Graves & Shapiro 2003, Bowers & Schmitt 2013). Furthermore, host shifts may have a number of effects on phytophagous populations (Bowers & Richardson 2013). The establishment of these new associations could be interesting from an evolutionary perspective, as they open an unexpected window for the understanding of the ecology and evolution of phytophagous insects (Tuda et al. 2014). Additionally, host shifts may have unexpected consequences at higher trophic levels, affecting, for instance, the behavior and physiology of parasitoids (Collatz & Dorn 1994).

Leucaena leucocephala (Fabaceae) (Fig. 1) is a tree species native in Central America the distributional range of which has been greatly expanded around the world mostly due to its cultivation (Rengsirikul et al. 2011, GISD 2014). This plant has become an invader in many localities where it has been introduced as a cultivar, and its presence may have severe effects on the native plant communities (Yoshida & Oka 2004). As a result, L. leucocephala has been listed among the world’s 100 worst invasive species (Lowe et al. 2000). In some places, however, L. leucocephala has been classified only as a ruderal plant, not reaching the status of invasive (Costa & Durigan 2010).

The coastal valleys of the northern Chilean Atacama desert are characterized by a high level of human disturbance, mostly due to agricultural activities that have resulted in habitat loss. As a consequence, the original habitat has been turned into farmland and native vegetation has been widely replaced by exotic cultivars and introduced plants (Luebert & Pliscoff 2006). Within this context, some native lepidopteran species have been found to colonize adventive plants, with a few examples reported for butterflies (Vargas 2013) and moths (Vargas 2010, Vargas et al. 2013).

The Geometridae (Lepidoptera) is one of the most diverse moth families (Scoble 1995). Their larvae are generally phytophagous, and may be very important components of folivorous assemblages (Scoble 1995, Marconato et al. 2008, Bodner et al. 2010). Macaria mirthae Vargas, Parra & Hausmann, 2005 (Fig. 2-3) is a geometrid moth native to the northern Chilean Atacama Desert, where its oligophagous folivorous larvae have been found to be associated to three native Fabaceae species: Acacia macracantha, Geoffroea decorticans and Prosopis tamarugo. These were the only host plants recorded for this moth until now (Vargas et al. 2005).

In January 2013 six geometrid larvae were collected from the exotic L. leucocephala in the Azapa valley (18° 31’ S, 70° 10’ W), northern Chilean Atacama Desert. The larvae were brought to the laboratory in plastic containers. Additional leaves of this tree were provided each day until the last instar larvae completed their feeding activity, about seven days after collection. Pupae were periodically observed in order to verify the emergence of adults. Three males and three females were obtained about fourteen days after pupation. Based on the original description provided by Vargas et al. (2005), we identified the specimens as M. mirthae. Subsequently, five males and six females were obtained between March and September 2013 following the same procedure.

This is the first mention of L. leucocephala as a host plant for M. mirthae, which coincides with the previously mentioned association of this moth with host plants of the family Fabaceae. In the same way, this report represents the first record of an exotic host plant for M. mirthae, adding one more record of an association of a native moth species with an exotic host plant in the coastal valleys of the northern Chilean Atacama Desert (Vargas 2010, 2013, Vargas et al. 2013). Our finding is coincident with observations made for some other Neotropical species of Geometridae. Host shifts to exotic plants have already been reported for