Shrinking leaves point to climate change

July 3 2012

University of Adelaide researchers have discovered that recent climate change is causing leaves of some Australian plants to narrow in size.

The study, which is the first of its kind in the world, highlights that plant species are already responding to changes in climate. The results are published online today in the Royal Society journal *Biology Letters*.

Researchers analysed leaves from herbarium specimens of Narrow-leaf Hopbush (*Dodonaea viscosa* subsp. *angustissima*) dating from the 1880s to the present. The study focused on specimens from South Australia's Flinders Ranges.

The analysis revealed a 2mm decrease in leaf width (within a total range of 1-9mm) over 127 years across the region. Between 1950 and 2005, there has been a 1.2ºC increase in maximum temperatures in South Australia but little change in rainfall in the Flinders Ranges.

"Climate change is often discussed in terms of future impacts, but changes in temperature over recent decades have already been ecologically significant," says Dr Greg Guerin, a Postdoctoral Fellow with the University of Adelaide's School of Earth and Environmental Sciences and lead author of the study.

"Climate change is driving adaptive shifts within plant species and leaf shape has demonstrated adaptive significance in relation to climate.

"Our results indicate that leaf width is closely linked to maximum

temperatures, and plants from warmer latitudes typically have narrower leaves.

"In the case of Narrow-leaf Hopbush, we can significantly link the changes in leaf width to changes in climate."

Dr Guerin says some Australian plant species have greater potential to respond to and cope with increasing temperatures than others. "It's important to understand how plants cope with changing climates, because species that are more adaptive to change may be good candidates for environmental restoration efforts.

"Other species in the region have less potential to adapt. These species may rely more heavily on migration – moving from location to location where the climate is favourable – but this can be problematic in a landscape fragmented by human activity," Dr Guerin says.

Provided by University of Adelaide