

Calligrapha beetle (352)

Common Name

Calligrapha beetle

Scientific Name

Calligrapha pantherina

Distribution

The beetle is native to Mexico. It was released in the Northern Territory of Australia in 1989, and after its successful control of *Sida acuta* there, it was later released elsewhere: Papua New Guinea (1999), Fiji (2002) and Vanuatu (2004). In 2016, it had reached New Caledonia without official release, and there was concern it might threaten native *Sida* species.

Hosts

Sida acuta (common wireweed), *Sida rhombifolia* (arrowleaf sida or paddy's lucerne), and *Sida spinosa*. *Sida acuta* is native to Central America, and present in South America, Africa, Asia and Oceania. *Sida rhombifolia* is also common throughout the tropics and sub-tropics. The distribution of these *Sida* species is very similar in the Pacific islands, but *Sida acuta* does not occur in Wallis and Futuna according to Waterhouse & Norris¹.

Description & Life Cycle

Both *Sida acuta* and *Sida rhombifolia* are common in pastures, plantation crops, cereals, root crops and vegetables, roadsides and waste lands. They have deep taproots and can withstand drought, mowing and shallow cultivation. Adults (Photos 1-3) and larvae (Photo 4) feed on the leaves and cause severe defoliation of both species (Photos 5&6).

Eggs are laid on the undersides of the older leaves. The larvae stay together after hatching and remain together except for the last moult when they disperse. Pupation takes place in the soil or leaf litter. Adults are brown when first emerged, but then become bright green with black markings.

From egg to adult is about 24 days, with adults living for an average of 18 weeks. The beetle spreads on the wing. If spread needs to be hastened or reintroductions are needed this can be done manually (see Management as Biocontrol Agents).

Impact

Reports from Australia record severe defoliation of *Sida acuta* resulting in vastly reduced seed production and plant density. Over a period of 10 years, there has been considerable impact in northern Australia, especially near coastal wetter sites. There have been reports from landowners that the control of *Sida* has resulted in a return to native pasture with growth of native herbs and grasses. Equally, there have been promising, though anecdotal accounts, of reductions in stands of *Sida rhombifolia* in Pacific island countries.

Detection & inspection

Look for the black larvae that feed together (until the last moult), and adults, iridescent green with black markings, that defoliate *Sida* plants.



Photo 1. Adult Calligrapha beetle, *Calligrapha pantherina*.

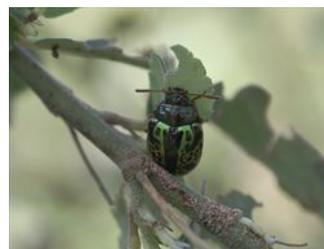


Photo 2. Adult Calligrapha beetle, *Calligrapha pantherina* feeding on a *Sida* leaf.



Photo 3. Larva of Calligrapha beetle, *Calligrapha pantherina*.



Photo 4. Adult *Calligrapha pantherina* on *Sida* stem.

Management of Biocontrol Agents

BIOSECURITY CONSIDERATIONS

Tests in Australia found that *Sida acuta*, *Sida rhombifolia* and *Sida spinosa* were good hosts of *Calligrapha*, and other native plants were relatively poor. However, checks are always needed before the beetle is introduced to any country as part of a biological control program.

FACTORS AFFECTING ESTABLISHMENT AND SPREAD

Establishment and sustainability of beetle populations in northern Australia depended on the condition of the *Sida*. During severe dry seasons growth was poor as was the survival of the beetles, and reintroductions were needed.

COLLECTING AND SPREAD

If *Calligrapha* need to be collected to spread the beetles to new *Sida* infestations or to reinfest areas where colonisation has failed, then do the following:

- If there are seasons, make collections in the wet, either by hand or by using a butterfly net.
- Collect at least 50 beetles and transfer them to the new site and release them together.
- After 2-3 weeks check for eggs and larvae, and later for adults.
- When the population has established over several square metres collect adults and distribute onto healthy *Sida* to speed the spread.



Photo 4. Damage to leaves of *Sida* caused by *Calligrapha* beetle, *Calligrapha pantherina*.



Photo 5. Damage to leaves of *Sida* caused by *Calligrapha* beetle, *Calligrapha pantherina*.

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¹Waterhouse DF, Norris KR (1987) *Sida acuta* Burman f. *Biological Control Pacific Prospects*. Inkata Press. Information Julien MH, et al. (Eds.) (2012) Biological control of weeds in Australia. CSIRO Publishing. pp. 525–526. (https://books.google.com.au/books?id=qe9xmWdOlvCR&printsec=frontcover&source=gbs_ge_summary_r&cad=0#v=onepage&q&f=false); and CABI (2017) *Sida acuta* (sida). Crop Protection Compendium. (<https://www.cabi.org/cpc/datasheet/49985>); and from Biological control of sida. Department of Land Resource Management. Northern Territory Government. (https://depws.nt.gov.au/_data/assets/pdf_file/0003/258087/Biological-control-of-Sida-2018.pdf). Photo 1 Mani Mua, SPC, Sigatoka Research Station, Fiji; Photos 2,4&5 Celia Symonds, University of NSW, Sydney, Australia.

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