

First record of *Micraspis frenata* (Erichson, 1842) (Coleoptera: Coccinellidae) feeding on pollen from *Carex appressa* R.Br. (Cyperaceae) in New South Wales, Australia

by Dr T.J. Hawkeswood*

*PO Box 842, Richmond, New South Wales, 2753, Australia (www.calodema.com)

Hawkeswood, T.J. (2011). First record of *Micraspis frenata* (Erichson, 1842) (Coleoptera: Coccinellidae) feeding on pollen from *Carex appressa* R.Br. (Cyperaceae) in New South Wales, Australia. *Calodema*, 144: 1-3.

Abstract: A new adult host plant, *Carex appressa* R.Br. (Cyperaceae) is recorded here for the Australian ladybird beetle, *Micraspis frenata* (Erichson, 1842) (Coleoptera: Coccinellidae) from near Wyong, New South Wales, Australia. The beetle has been previously recorded feeding on nectar from flowers of *Asclepias curassavica* L. and *Gomphocarpus physocarpus* E. Mey (Asclepiadaceae) in the Toowoomba area, south-eastern Queensland as well as on the pollen of numerous introduced grasses (Poaceae) in the Sydney region. Evidence is mounting that this beetle derives substantial nourishment from pollen of monocotyledonous plants. This appears to be the first record of an insect feeding on *Carex* pollen.

Key words: *Micraspis frenata*, Coccinellidae, Coleoptera, new feeding record, *Carex appressa*, Cyperaceae.

Introduction

The genus *Micraspis* Dejean, 1836 (Coleoptera: Coccinellidae) is distributed within the Palaearctic, Oriental and Australian Regions (i.e. from Japan and China, west to India and Africa and east to Melanesia and Australia)(e.g. Pope, 1988; Hawkeswood, 1994; Hawkeswood & Turner, 2002; Turner & Hawkeswood, 2003). The genus contains at least 30 species and is represented in the Australian region by at least 6 species (Pope, 1988). The most common and best known species of the genus in Australia is *Micraspis frenata* Erichson, 1842, (previously known as *Verania frenata* Erichson, 1842), which is distributed from New Caledonia to Australia [i.e. Queensland, New South Wales, Victoria, Tasmania, South Australia and the Northern Territory (Pope, 1988)]. The adults of *M. frenata* are bright orange in colour and have distinctive black longitudinal markings on the elytra and measure 3.8-5.0 in total body length (Pope, 1988). The adult beetles are often found during summer days on a number of plant species where they are purported to feed on aphids (i.e. Thompson, 1893; Koebele, 1893; Froggatt, 1902, 1907; Swezey, 1905; Tillyard, 1926; Pope, 1988; Hossain *et al.*, 2001). Hawkeswood (1994) provided the very interesting observations of this species feeding on the nectar of *Gomphocarpus physocarpus* E. Mey and *Asclepias curassavica* L. (Asclepiadaceae) from the Toowoomba district, south-eastern Queensland. The species has also been recorded feeding on the pollen of six native and non-native grass species, *Chloris gayana* Kunth, *Chloris truncata* R.Br., *Paspalum urvillei* Steud., *Setaria gracilis* Kunth [= *Setaria geniculata* (Lam.) Beauv.], *Sorghum bicolor* (L.) Moench ssp. *bicolor* and *Themeda australis* (R.Br.) Stapf. (Poaceae)(Hawkeswood & Turner, 2002) as well as *Lolium perenne* L. (Turner & Hawkeswood, 2003) in the Sydney district, New South Wales, Australia.

Observations

During the afternoon of 21 September 2009, I observed numerous adults of *M. frenata* on the flowers and foliage of the native sedge *Carex appressa* R.Br. (Cyperaceae) growing along the banks of a small creek bed and around a small lagoon near Wyong, New South Wales, Australia. The vegetation of the area was mainly associated with introduced weeds but the *C. appressa* was associated with *Eucalyptus maculata* Hook. woodland. Air temperatures were approx. 25-28 degrees Celsius during the time of observations. The general weather conditions were overcast and humid. Ten plants of *C. appressa* were examined, and 7, 5, 4, 6, 6 and 2 beetles [N = 30, X = 5.0] were counted on inflorescence of six of the plants, one beetle per inflorescence in all cases. No flight was observed by any of the beetles despite the humid conditions. Most of the beetles were on inflorescences with freshly opened flowers. Three beetles were observed feeding on pollen during the course of

observations. No aphids were observed on any of the *C. appressa* plants.

Discussion

The larvae and adults of most Australian species of Coccinellidae are carnivorous, preying upon aphids, coccids or other small insects and mites (e.g. Britton, 1970; Hawkeswood, 1987). All of the earlier main references dealing with Australian insects, i.e. Froggatt (1907), Tillyard (1926), and McKeown (1942), mention that ladybird beetles usually feed on scale-insects, aphids and mites, while a few other species such as *Epilachna*, feed on vegetation, usually crop plants. None of these authors mentioned that Coccinellidae are known to feed on nectar or pollen in the adult stage. Early observations on *M. frenata*, i.e. Thompson (1893), Koebele (1893), Froggatt (1902, 1970) and Swezey (1905), mentioned that the beetle was an aphid feeder, feeding on those species particularly frequenting grasses, including sugar cane (*Saccharum officinarum* L.)(Poaceae). Swezey (1905) also recorded *M. frenata* as feeding on young leaf-hoppers in a insectary and suggested that it might do so in the field, if aphids became scarce. None of these authors mentioned that *M. frenata* fed on nectar and/or pollen from flowers. Pope (1988) briefly noted that the label data in museum collections indicated that the species was associated with many other plants, including citrus, cotton, sorghum, lucerne, peach trees, maize, potatoes and paw-paw. Unfortunately, the association of *M. frenata* with all of these plants is not clear, but the beetles at the time of their capture, were most probably feeding on aphids, etc, or they may have been simply resting or perching on the leaves of these plants (Hawkeswood, 1994). Pope (1988) also noted that *M. frenata* had been reared in captivity on *Heteromyzus* aphids on *Sonchus oleraceus* L (Asteraceae). Studies both in the field and the laboratory by Anderson & Hales (1983) have shown that multivoltine *M. frenata* [cited erroneously as *Micraspis lineata* (Thunberg, 1781)] is polyphagous, capable of completing larval development and reproducing in the field on either aphids or pollen, and in the laboratory, additionally on powdered, freeze-dried, honey bee brood. Anderson & Hales (1983) made no observations on nectar utilization by adult beetles of *M. frenata*, but stated that it was this feeding versatility (i.e. polyphagy) which enabled the species to remain reproductively active from early spring to early autumn. Hawkeswood (1994) noted that *M. frenata* is a small beetle capable of reaching the nectar at the base of the asclepiad flower but may play no role in pollination of these plants because they may not be capable of transporting the pollinaria to another flower for cross-pollination. In the case of the seven grass species reported by Hawkeswood & Turner (2002) and Turner & Hawkeswood (2003), *M. frenata* is probably best regarded as a pollen robber and probably plays only a small role in pollination as these grass species are generally regarded as wind pollinated. Again, as with the case of *M. frenata* feeding on Asclepiadaceae flowers, these adults most probably utilize the pollens of these grasses when aphids are absent or are in short supply. During the summer season at Grose Vale and Kurmond, *M. frenata* was found to be rather common while aphids were conversely scarce (Hawkeswood & Turner, 2002; Turner & Hawkeswood, 2003). Additionally, since many specimens were observed mating the pollens are probably also very important in egg production by providing essential proteins.

Although further observations are needed, it appears that *M. frenata* is also common in the Wyong area and in the absence of aphids, derives nourishment from the pollen of the *Carex*. Interestingly, *M. frenata* was not found on any other flowering dicotyledonous or monocotyledonous plants in the area, either native or introduced.

Carex appressa is a densely tufted herb growing to about 0.8. m high with a short rhizome with erect culms 40–120 cm long and 2–4 mm diameter. The leaves are shorter than the culms with the blade measuring 2–12 mm wide. The inflorescence is erect, narrow, 4–5 cm long, compound, with numerous short spikes solitary at nodes or on appressed spike-like secondary branches to 3 cm long. The flowering spikes are sessile, contiguous, erect to spreading at maturity, and measure up to 1 cm long. all spikes are androgynous. The anthers measure 1.5–2 mm long excluding an appendage c. 0.2 mm long. The anthers are well exerted and allow easy access to the small lady

bird beetles. As far as I am aware, this is the first insect recorded as feeding on the pollen of *C. appressa*.

Acknowledgements

I wish to thank Mr Richard W. Wells of Lismore, New South Wales for taking me to the study site.

References

- Anderson, J. M. E. & Hales, D. F. (1983). *Micraspis lineata* (Thunberg) (Coleoptera: Coccinellidae) - seasonality and food. *General and Applied Entomology*, 15: 47-52.
- Britton, E. B. (1970). *Coleoptera. Chapter 30. In: The Insects of Australia*. CSIRO & Melbourne University Press, Victoria: 495-622.
- Erichson, W.F. (1842). Beitrag zur Insecten-Fauna von Vandiemensland, mit besonderer Berücksichtigung der geographischen Verbreitung der Insecten. *Archiv für Naturgeschichte, Berlin* 8: 83-287, pls IV, V.
- Froggatt, W. W. (1902). Australian ladybird beetles. *Agricultural Gazette of New South Wales*, 13: 895-911.
- Froggatt, W. W. (1907). *Australian Insects*. W. Brooks & Co., Sydney.
- Hawkeswood, T. J. (1987). *Beetles of Australia*. Angus & Robertson Publishers, Sydney: 1-248.
- Hawkeswood, T. J. (1994). Notes on the Australian ladybird beetle *Micraspis frenata* (Erichson) (Coleoptera: Coccinellidae) feeding on nectar from *Asclepias* and *Gomphocarpus* flowers (Asclepiadaceae). *Giornale Italiano di Entomologia*, 7: 67-71. [pdf file available at www.calodema.com].
- Hawkeswood, T.J. & Turner, J.R. (2002). Observations on the adults of *Micraspis frenata* (Erichson, 1842) (Coleoptera: Coccinellidae) feeding on the pollen of native and non-native grasses (Poaceae) in eastern New South Wales, Australia. *Journal of the Entomological Research Society*, 4(2): 21-29. [pdf file available at www.calodema.com].
- Hossain, Z., Gurr, G.M. & Wratten, S.D. (2001). The potential to manipulate the numbers of insects in lucerne by strip cutting. *Australian Journal of Entomology*, 39: 39-41.
- Turner, J.R. & Hawkeswood, T.J. (2003). Further observations on the feeding of adult *Micraspis frenata* (Erichson, 1842) (Coleoptera: Coccinellidae) on the pollen of grasses (Poaceae) in New South Wales, Australia. *Calodema*, 1: 22-23. [pdf file available at www.calodema.com].
- Koebele, A. (1893). *Studies of parasitic and predaceous insects in New Zealand, Australia and adjacent islands*. Government Printing Office, Washington.
- McKeown, K.C. (1942). *Australian Insects*. Royal Zoological Society of New South Wales, Sydney: 1-304.
- Pope, R. D. (1988). A revision of the Australian Coccinellidae (Coleoptera). Part 1. Subfamily Coccinellidae. *Invertebrate Taxonomy*, 2: 633-735.
- Swezey, O. H. (1905). Leaf-hoppers and their natural enemies. Part VII. (Orthoptera, Coleoptera, Hemiptera). *Bulletin of the Hawaiian Sugar Planters' Association*, 1: 211-238.
- Thompson, E. H. (1893). Notes on Tasmanian Coccinellidae. *Insect Life*, 6: 11-12.
- Tillyard, R. J. (1926). *The Insects of Australia and New Zealand*. Angus & Robertson, Sydney: 1-560.

Date of publication: 15 February 2011

Copyright: Dr T.J. Hawkeswood

Editor: Dr T.J. Hawkeswood (www.calodema.com)

(Published as hard paper copy edition as well as electronic pdf)