

## The Hibiscus Erineum Mite, *Aceria hibisci* (Acari: Eriophyidae) a New Introduction in the Caribbean and a Potential Threat to Florida's Hibiscus<sup>1</sup>

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The hibiscus erineum mite (=hibiscus erinose mite, hibiscus leaf-crumpling mite) was originally described as *Eriophyes hibisci* (Acari: Eriophyidae) from *Hibiscus rosa-sinensis* L. (Malvaceae) in the Fiji islands by Nalepa (1906) and later transferred to the genus *Aceria* (Keifer 1966). Feeding by this mite deforms young leaves and developing vegetative buds. Nalepa (1909) reported *A. hibisci* from the Samoan Islands with additional morphological and feeding damage details. The mite is also known from the Cook Islands and Tonga.

Hara et al. (1996, 2001) reported *A. hibisci* in Oahu, Hawaii, USA in 1989. Kumashiro (1998) reported *A. hibisci* on the Hawaiian island of Lanai in 1995. In 1992 the mite was reported from New South Wales, Australia where unconfirmed reports suggest it may have been established there as early as 1978 (Carson and Gough 2007). The mite is also widespread in southeastern Queensland (Carson and Gough 2007). Quilici et al. (1997) reported *A. hibisci* from *Hibiscus* sp. on Reunion Island. *Aceria hibisci* was first collected in the Caribbean region on the

islands of Martinique in 1997 and Guadeloupe in 1998 and 2000 from *Hibiscus rosa-sinensis* and *Hibiscus* sp. (Flechtmann et al., 1999 and Flechtmann and Etienne, 2001). De la Torre and Martinez reported the mite from Cuba in 2004 on *Talipariti elatum* (Sw.) Fryxell. (Malvaceae). Specimens from Dominica and Jamaica were submitted to the Division of Plant Industry, FDACS, in 2007 and early 2008 were confirmed as *A. hibisci*. *Aceria hibisci* has probably been in Jamaica since at least 2005 (J. Goldsmith, personal communication). In Puerto Rico, galls have been observed in *Hibiscus rosa-sinensis* by personnel of the local Department of Agriculture since 2000.

*Aceria esculenti* Keifer 1966 was described from okra, *Abelmoschus esculentus* Moench (= *Hibiscus esculentus* L.) based on specimens from Brazil. Jeppson et al (1975) and Perring (1996) without any explanation considered *A. esculenti* to be the same as *A. hibisci*. Perring (1996) also reported *A. hibisci* from "Eastern Europe" without providing details on the host or locality. It remains to be established if *A.*

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*esculenti* and *A. hibisci* are the same or different species.

## Description

All Eriophyoidea are obligate vascular plant feeders. Eriophyid mites can be distinguished from other phytophagous mites by their small size, wormlike body and two pairs of legs. *Aceria hibisci* are about 0.2 mm long and barely visible with a good hand lens. The presence of this mite and many eriophyid mites can be established by the feeding damage (galls, erineia, bronzing, withches broom, etc) or by careful examination of plant material under a good dissecting microscope.

## Symptoms and Identification

Feeding by the hibiscus erineum mite results in deformed leaves, stems, twigs and flowers. A common character is the production of puckered bumps on the leaves (leaf edge, leaf underside and leaf upperside) (Figures, 1-3). The underside of these bumps shows different compartments which are usually lined with a pale yellowish velvety growth called erineia. Leaf axils can also be deformed (Figure 2). Damage can also be observed on unopened flowers. Flowers affected by the mite show deformation and the galls are usually found on the internal part of the flowers (Figure 5). Damage on the lower part of the leaf stem is characterized by the production of a corky tissue. Other organisms (mites, plant bugs) can be found on these corky bumps, but their role in bump development is not determined yet. The gall development and leaf deformation is more intense when the infestation occurs on young leaves and developing vegetative buds.

Newly formed galls are as small as a pin head, greenish and pimple like, while galls that are well developed can measure around 0.2 cm in length and more increasing in size and length as mite feeding progresses.

## Dispersal

Under natural conditions, the *A. hibisci* disperses probably on the wind along with most other plant feeding mites. Transport of infested plants or plant material is certainly a major mode of dispersal for



**Figure 1.** Galls formed on leaves and petioles of *Hibiscus* spp. Credits: J.C. Rodrigues



**Figure 2.** Galls formed on leaves and petioles of *Hibiscus* spp. Credits: J.C. Rodrigues

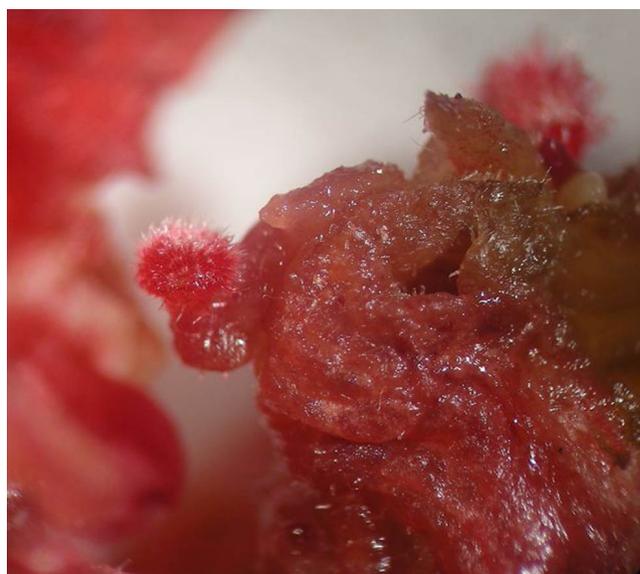
this mite because the hibiscus host plants are mostly propagated vegetatively.



**Figure 3.** Galls formed on leaves and petioles of *Hibiscus* spp. Credits: J.C. Rodrigues



**Figure 4.** Hibiscus plant deformed by *A. hibisci* galls. Credits: J.C. Rodrigues



**Figure 5.** Galls on Hibiscus flowers. Credits: J.C. Rodrigues

## Hosts

The hibiscus erineum mite appears to prefer *Hibiscus rosa-sinensis* (Chinese red hibiscus) throughout most of its known range, but it will feed on other hibiscus species including *Talipariti elatum* (De la Torres and Martinez 2004). The host for *A. hibisci* from Reunion Island and some Caribbean sites were only identified as *Hibiscus* sp. Harra et al (2001) reported that the *Hibiscus rosa-sinensis* cultivars 'Apricot', 'Empire', 'Pink Hibiscus', 'Itsy Bitsy Peach "Monch"', "'Zham" Chinese', and 'Apple Blossom' were less susceptible to *A. hibisci* than 'Chinese Red', 'Herman Shierman', 'Orange hibiscus', 'Nii Yellow', and 'Kardinal' in tests conducted in Maui, Hawaii, USA. *Aceria hibisci* has been reported to attack *Abelmoschus esculentus* Moench (okra) causing irregular erineum pockets (Jeppson et al 1975, Perring 1996). In Puerto Rico, *Malvaviscus arboreus* Cav. (wax mallow) growing side by side with heavily infested hibiscus plants did not show galls or signs of infestation by the mite.

## Control

Biological control. Predatory mites of the family Phytoseiidae have been found associated with the galls at several sites. Samples from Dominica, Jamaica and Puerto Rico had the predatory mites 219862149species219862149PEPena, Jorge E associated with the galls. On Reunion Island *Phytoseius intermedius* Evans and McFarlane was

reported associated with *A. hibisci* on *Hibiscus* sp. At this time no other phytoseiid or predatory mite species associated with the *A. hibisci* have been identified.

Cultural control. Pruning of infested branches is only a temporary fix for an infestation. New growth on the same plant is frequently infested.

**Chemical control.** Specific chemical control recommendations are difficult due to label restrictions. For information on current acaricides registered for general outdoor ornaments or specifically for hibiscus, consult the local Cooperative Extension Service office. Chemical control will only affect the new growth and the already damaged leaves will persist until they die or are pruned off. After any chemical treatment the affected plant parts should be pruned.

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