Zootaxa 1662: 35–43 (2007)
www.mapress.com/zootaxa/

ISSN 1175-5326 (print edition)
ZOOTAXA
ISSN 1175-5334 (online edition)

Detection, extraction, and collection of eriophyoid mites

ROSITA MONFREDA[1], GIORGIO NUZZACI[2] & ENRICO DE LILLO[3]

Di.B.C.A. - sezione Entomologia e Zoologia, Università degli Studi di Bari, via Amendola 165/a - 70126 Bari, Italy.
E-mail: [1]monfreda@agr.uniba.it; [2]nuzzaci@agr.uniba.it; [3]delillo@agr.uniba.it.

Abstract

Methods for routine detection, collection and extraction of eriophyoid mites and their eggs are described. They allow for the collection of numerous mites from complex plant structures and from low-density populations spread on large plant surfaces. Washing parts of infested plants with a solution containing bleach and detergent easily removes live and dead eriophyoids. These mites can be concentrated by sieving through fine mesh screens or centrifugation and subsequently managed for many purposes (*i.e.* rearing, host-specificity bioassays or field release, slide preparation, mite surveys, estimation of mite population size, etc.).

Key words: Acari; live specimens; monitoring; host-specificity bioassays; mite release; taxonomy; Eriophyoidea

Introduction

Studies requiring accurate assessment of population size, pest surveys, taxonomy, rearing and mass release need to gather as many mites as possible. Among Acari, the tiny body size of eriophyoid mites makes them difficult to detect and manage, especially when they must be kept alive on plants for host specificity tests or further studies. Researchers mostly collect specimens directly from plant material under a dissection microscope or utilize cuttings to infest plants. The hidden life-style on leaflets, trichomes, buds, inflorescences, other plant structures and deformed organs offer protective sites and negatively affect the accuracy and efficacy of eriophyoid detection, count, collection and manipulation. In addition, a population can also be present when symptoms are not evident.

Methods commonly applied are often labour-intensive, time-consuming, tedious and sometimes inaccurate with either fresh or dried samples. Live mites can be accidentally crushed during individual transfer and there is a concern that predators or other non-target mites/insects could accidentally be released on test plants.

Many techniques have been developed to assist the operator to detect or measure mite populations on plant structures (Scriven & McMurtry 1971; Weigmann *et al*. 2004), but also from animals (Rinderer *et al*. 2004), laboratory colonies (Stepien & Rodriguez 1973), air (Zhao & Amrine 1997a; Duffner *et al*. 2001) and snow (Zhao & Amrine 1997b). Some of these methods are inappropriate for small and weakly-sclerotised mites such as eriophyoids. In a few cases, procedures using sticky tape (Harvey & Martin 1988; Duffner *et al.* 2001; Davies *et al*. 2002; Bernard *et al*. 2005), ultrasonic (Gibson 1975), electrostatic (Stone 1981) and centrifugal-flotation (Sternlicht 1966; Willers *et al*. 1992) have been used. Most of the applied methods utilize a shake-and-wash technique to dislodge mites from leaves, shoots, buds and plant deformations (Vial & Monterrat 1971; Martin 1977; Perring *et al*. 1996; Pérez-Moreno & Moraza Zorilla 1997; Zacharda *et al*. 1998; Faraji *et al*. 2004; Siriwardena *et al*. 2005). However, some washing chemicals are expensive, difficult

Accepted by O. Seeman: 7 Nov. 2007; published: 17 Dec. 2007