My notorious mites: A tale of every neophyte Acarologist

Safeena Majeed, A. A

Mites, the siblings of insects are the tiny arthropods belonging to the class Acari. As most of us think, working with mites is a cinch, a blink of an eye, because of their non flying habit and pretty shorter life cycle, but the opposite is true. Here I am sharing my hurdles as a novice Acarologist and also few tips for fledglings like me.

I started my research with mites as an M Sc scholar, and these tiny creatures made me weep like anything during those days. Despite lifting them (of course using a hairbrush) like a rose petal, they use to die after a day. As a young acarologist, I was unaware of the fact that, even though mites seem resting on the leaf, they might be enjoying their meal over there. If we try to transfer them, it may cause breakage of their delicate chelicera and cannot feed anymore. In addition to desiccation, starvation also fastens their death. It will be hard for you to believe that I spent a whole semester to learn its rearing and life stages. But yes, I did.

Our common understanding about mites is that they require higher temperatures, and complete their life cycle quickly when the temperature is high. Like every other organism, there exist a threshold temperature for mites too, or stop laying eggs or even no hatching of eggs. Besides some subtropical mites are stenothermic (organisms with very narrow temperature range), which was one more problem until I trotted out which are all those culprits in my study as they cannot be cultured and maintained at all prevailing temperatures. One more so-called assumption is that the life cycle of mites is going to end by 3-4 days. But it's not just 3-4 days; it was an alarm clock for every 3-4 hours!!! Yes, if we are doing biology of mites then you should do mere vigilance until the cycle is over. Because they change their stages overnight, so fixing an alarm every 3 hours is must to trace their developmental period. Isn't it too easy?

After toiling so hard in front of microscope day and night for a long period, with a slight increase in the eyesight, I thought this liaison with mites came to an end when I submitted my thesis. But it was just a trailer; the whole film was waiting for me in Ph.D. Again it was acarology, but this time came up with a twist called taxonomy. As usual, I assumed that it's going to be easy due to the overconfidence of holding a thesis in acarology, but again it was a standout.

My experience taught me that collecting too many samples of mites at a time can only cause a huge mess and resource and time wastage. One more concern is that, as we collect mites along with leaves, chance of predation inside the polythene bags is much higher by predatory mites and other insect predators like *Stethorus, Oligota,* Staphylinid beetles, Cecidomyiids, predatory thrips which

coexists with prey mites. Moreover, chances of leaf rot also exist. Eureka… we have got a refrigerator for that! Miserably, it won't work beyond 4-5 days, mites will die out of freezing and we get nothing in our hands. Even some mono and oligophagous endemic mites, won't multiply in the laboratory however hard we may try.

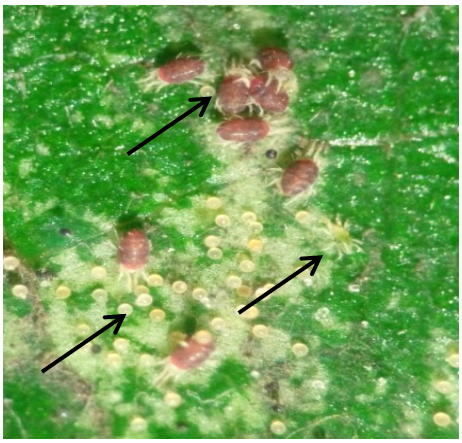

Fig. 1. Colony of *Tetranychus hirsutus* Zeity & Srinivasa: Red large mites – females, small whitish green circles – eggs, small greenish mites – males (arrows indicating the mites).

After losing my samples multiple times, I started exploring some tricks and techniques; increasing the sample size. So that, paramount of mites will be retained even after a few consumed by the predators present on the same leaves. Additionally, these predators retained on those leftover mites can be used to build the repository of predatory mites and also the multiple mite pests on the same host, which might have differentiated their niches wisely. Additionally, never forget to keep your slides, culturing trays and vials with absolute alcohol (or the buffer for DNA extraction) while processing, so that you can simultaneously transfer few mites to the culturing trays in addition to making slides and taking them into alcohol/buffer. This will reduce the time of searching them again for different purpose.

Fig. 2. Predatory Cecidomyiid grub: *Feltiella* sp. feeding on *Tetranychus macfarlanei* Baker and Pritchard

While working with mites which are sparse in number and difficult to culture in the laboratory, it's always better to preserve specimen in alcohol to analyze using molecular tools. Always try to make sketches and photographs as soon as slides are ready, otherwise we may miss some novel key features later in a hurry. Never miss to note down even a silly point about the behaviour (webbing pattern, post egg laying rituals/operations, host preferences, crowding and ballooning behaviour, *etc*.) during the processing, although it is not a part of the present research, for sure it's that portentous part, where we will learn science beyond our research for which we all here. For example the webbing, which varies from regular spider mite webbings to multistoried webs in *Tetranychus hirsutus* Zeity & Srinivasa and to nests like webs in *Schizotetranychus* spp, by which sometimes mites can be identified in those samples (at least up to genus level) where only webbings are leftover and can go back to the same location and collect if found interesting.

With all my vigil as a novice in acarology, I can proudly say that mites are one among the masterpieces that Mother Nature has bestowed us with. If we follow a few basic rules with little patience, we can enjoy ourselves with mites too. No alarms are needed; we'll be sitting with eyes full of curiosity, fascination and surprises in front of the microscope. Happy quaren-time.

AUTHOR

SAFEENA MAJEED, A. A.- *Ph. D. Scholar, University of Agricultural and Horticultural Sciences, Shivamogga, Karnataka, India.* Email*:* safeenamajeed786@gmail.com