e ISSN–2321–7987 | ●●● Article ●●● |Visit us : *www.researchjournal.co.in*|

Biodiversity of spider mites (Family: tetranychidae)

Pankaj P. Pokle and Abhishek Shukla
Department of Entomology, AINP on Agricultural Acarology, Navsari Agricultural University, NAVSARI (GUJARAT) INDIA

Mite is latinized term of word Acari, originated as early as 1650, though its existence was referred to 850 B.C. by Homer. In recent time mites are gaining importance as pests of crops. The phytophagous mites belong to five families *viz.*, Tetranychidae (common red spider mite), Tenupalpidae (common false spider mite), Tarsonemidae (common broad / yellow mite), Eriophyidae (common erineum mite) and Tuckrellidae (common peacock mite). A multitude of mites live on plants, where they feed on plant cells, fungi, pollen and small arthropods-especially other mites. Spider mites are among the best-known of the Acari. The costs incurred from crop losses and control strategies are measured in millions of dollars, but we most frequently blame this damage on a few common species *i.e.* Two-spotted spider mite or European red mite. The group Acari is a very diverse group and, therefore, to minimize the damage from these mite pests the need arises to know the diversity and species compositions. The family Tetranychidae is a diverse group and causing most of the damage to the crops throughout the world including India and Gujarat. This is the reason why the study of Tetranychid mites has received worldwide attention.

What is biodiversity ? Biological diversity or the shorter "biodiversity" (bio-di-ver-si-ty) simply means the diversity or variety of plants and animals and other living things in a particular area or region. Biodiversity also means the number or abundance of different species living within a particular region.

Why is biodiversity so important? Everything that lives in an ecosystem is part of the web of life, including humans. Each species of vegetation and each creature has a place on the earth and plays a vital role in the circle of life. Plant, animal, insect and mite species interact and depend upon one another for what each offers, such as food, shelter, oxygen, and soil enrichment. Maintaining a wide diversity of species in each ecosystem is necessary to preserve the web of life that sustains all living things.

Characteristics of Tetranychids :

–Mites are called spider mites because of the fact that these mites like spiders can spin webs to cover their colonies for getting protection from natural enemies.

–Soft bodied and are red, yellow, green, orange in colour and size -5-6 mm long. Chelicerae movable, stylet-like Palpi - 4 segmented, with strong claws.

–Aedeagus of male is characteristic of family.In subfamily Bryobiinae, there are 3 pairs of anal setae while in Tetranychinae there are 2 pairs of anal setae.

–The reproduction is by both arrhenotoky and thelytoky.

–Damages by causing yellowing to bronzing of leaves and causes defoliation.

Acarines of economic importance in agriculture	Systematic position of Tetranychid mite
Tetranychidae- Red spider mite	Domain: Eukarya
Tuckrellidae- Peacocock mite	Kingdom: Animalia
Tarsonemidae- False spider mite	Phylum: Arthropoda
Tenuipalpidae- Yellow mite	Subphylum: Chelicerata
Eriophyidae- Erenium mite	Class: Arachnida
	Order: Acarina
	Suborder: Trombidiformes
	Supercohort: Trombidiformes
	Cohort: Promatia
	Super family: Tetranychoidae
	Family: Tetranychidae
	Genus: *Tetranychus*
	Species: *urticae, ludeni,*

Family: Tetranychidae : Eight species are reported under this family. These species are included under two sub families: Bryobiinae and Tetranychinae

Subfamily: Bryobiinae	Subfamily: Tetranychinae
Only one genus is reported under the subfamily namely: Bryobia	Eight species are reported under this sub family which include four genera namely Eutetranychus. Eotetranychus, oligonychus and tetranychus.

Diversity of family		
World	India	Gujarat
Helle and Sabelis (1985)	Gupta (1994)	Anonymous (2013)
6 tribes, 71 genera, 1200 species.	6 Tribes, 20 genera, 100 species.	9 Species.

Important members of family Tetranychidae : *Tetranychus urticae* (Koch.), *Tetranychus ludeni* (Zacher), *Tetranychus macfarlanei* (Baker and Pritchard) , *Oligonychus indicus* (Hirst.), *Oligonychus*

oryzae (Hirst.), *Petrobia latens* (Muller), *Schizotetranychus andropogoni* (Hirst.).

***Tetranychus urticae* (Koch.) :** This species has worldwide distribution and reported on 200 hosts (Major hosts are beans, cucurbits,tomato, okra, brinjal,cotton etc.)

Damage : Feeds on lower surface of leaves with intense webbing and punctures leaf lamina and suck the oozing sap.

Biology : The male requires about 9.5 days to complete their life cycle whereas female requires 23 days to complete the same.

***Tetranychus ludeni* (Zacher) :** It has been distributed Worldwide with Cow pea is major host including other 70 hosts.

Damage : Webbing is the typical symptoms and also leads to the decrease in chlorophyll content of the leaves.

Biology: Completed within 10 days by sexual reproduction and 9 days by parthenogenesis.

***Tetranychus macfarlanei* (Baker and Pritchard) :** It has been distributed throughout India and recorded on Cotton and other malvaceous hosts.

Damage : Feeds on lower surface of leaves, causing yellowing of leaves and becomes serious during later stages of crop.

Biology : The male requires about 10 days to complete their life cycle whereas female requires 12 days to complete the same.

***Oligonychus oryzae* (Hirst.) :** It has been found mainly in Karnataka,T.N., Kerala, Orissa, Punjab and Andaman and Nicobar Islands and major host is rice.

Damage : Leaf burning and defoliation of leaves takes place.

Biology :The male requires about 14 days to complete their life cycle whereas female requires 20 days to complete the same.

***Oligonychus indicus* (Hirst.) :** It has been distributed World wide and found in India in Gujarat, Assam, Kerala, Punjab,Tamil Nadu and recorde on different hosts such as Sorghum, Jute, Sugarcane, Maize, Ragi, Bajara.

Damage : Leaves turns reddish which later increases and withers

Biology : The male requires about 6 days to complete their life cycle whereas female requires 7 days to complete the same.


Oligonychus oryzae

***Petrobia latens* (Muller) :** It was first reported in Denmark and In India it was found in Rajasthan, M.P., Delhi, Punjab, Haryana, U.P. on different hosts such as Wheat, barley, bajara.


Petrobia latens

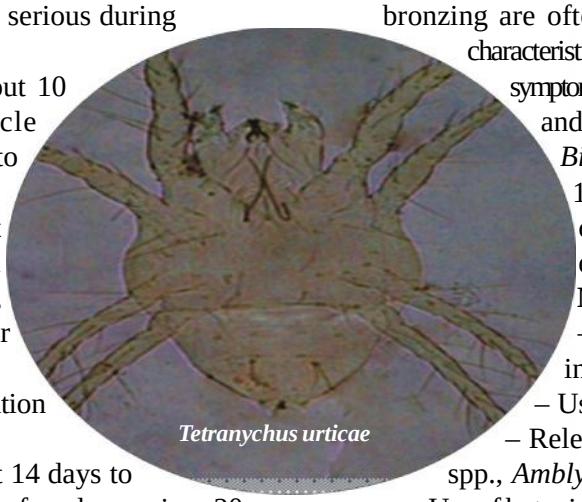
Damage : Typical character of this species is that it does not produces webbing while plants become chlorotic due to loss of cell sap and leaves show yellowing and bronzing appearance.

Biology : Completed within 10-14 days

***Schizotetranychus andropogoni* (Hirst.) :** It is serious pests of North India and found on rice in North east and also recorded on Sugarcane, Rice.


Schizotetranychus andropogoni

Damage : Changes in colour from yellowing to bronzing are often characteristics symptoms and webbing is also observed.


Tetranychus urticae

Biology : The male requires about 16.5 days to complete their life cycle whereas female requires 13 days to complete the same.

Management of spider mites :

– Collection and destruction of infested leaves.
– Use of resistant varieties.
– Release of predators like *Phytoseilus* spp., *Amblyseius* spp.
– Use of botanicals in combination with chemicals.
– Application of micronutrients.
– For effective control of mites use any one of the acaricides. Prepare the spray fluid in 10lit. of water.
– Propergite 57% EC 10ml
– Abamectin 1.8% EC 2ml
– Milibemectin 1% EC 5ml
– Diafenthiuron 50% WP 10g
– Fenazaquin 10% EC 10ml
– Fenpyroximate 5% EC 10ml
– Ethion 50% EC 10ml
– Acephate 75% EC 12g
– Chlorfenapyr 10% SC 10ml

Received : *05.02.2015* ***Revised :*** *04.05.2015* ***Accepted :*** *18.05.2015*