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Research Article

Influence of Weather Factors on Incidence and Severity of *Tetranychus turkestani* (Acari: Tetranychidae) on Mulberry

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Abstract

Background and Objective: Production of quality mulberry leaf and subsequent production of quality silk is hampered due to the incidence of various insect pests. Such incidence of pests has been found to be affected by weather parameters. Strawberry spider mite, *Tetranychus turkestani* (Ugarov and Nikolskii) have been found to damage large number of agriculture crops. This study was conducted in Pampore of Kashmir valley, India during 2011-2012 cropping seasons to measure the incidence (mite incidence, MI) and severity (percent damage index, PDI) of *Tetranychus turkestani* on mulberry foliage in relation with climatic factors. **Materials and Methods:** Observations were made fortnightly on the incidence and severity of pest from May-October along with the influence of weather parameters. Mite species were recorded from May onwards until leaf fall in October during 2011 and 2012. **Results:** Incidence and severity were lesser during May and reached maximum during 2nd fortnight of July and 1st fortnight of August from there it declined to reach a lower level during 2nd fortnight of October with the onset of leaf fall. Correlations were positive and highly significant for both incidence and severity. The minimum temperature and relative humidity registered significant positive correlation and rainy days showed negative correlation with both MI and PDI. Multiple regression modules with five weather parameters of same and previous fortnight with incidence and severity had higher probability and R^2 values. **Conclusion:** This study showed that *T. turkestani* is a serious pest to mulberry foliage causing severe damage to its quality and quantity with respect to the weather conditions.

Key words: Weather parameters, *Tetranychus turkestani*, mulberry, incidence, severity

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Data Availability: All relevant data are within the paper and its supporting information files.

INTRODUCTION

Leaves of Mulberry, *Morus* spp. (Urticales: Moraceae), a sole food for rearing silkworm, *Bombyx mori* L. (Lepidoptera: Bombycillidae) are exposed to about 300 insect and non-insect species of pests[1-3] and a limited number of them is considered to be important. In Kashmir valley, India, Lesser Mulberry Pyralid, *Glyphodes pyloalis* Walker (Lepidoptera: Pyralidae), mulberry looper, *Hemerophila atrilineata* Butler (Lepidoptera: Geometridae), leaf spot, *Cercospora moricola* Cooke (Capnodiales: Mycosphaerellaceae) and powdery mildew, *Phyllactinia corylea* (Pers.) P. Karst (Erysiphales: Erysiphaceae) are the major biological threats of mulberry which showed a greater variation in damage extend due to weather parameters[4-7]. Sixteen species of mite pests have been recorded on mulberry throughout the world and half of them have been documented from India[8]. The strawberry spider mite, *Tetranychus turkestani* (Ugarov and Nikolskii) (Acari: Tetranychidae) has been reported on *Morus rubra* L. from southwestern United states and on *M. alba* L. and *M. nigra* L. in north-eastern Iran causing leaf quality deterioration[9,10]. It is a widespread pest with a wide host range consisting of more than 300 plant species including cotton, beans, cucurbits, alfalfa, soybean, sugar beet and cowpea[11-17]. This mite infests both sides of leaves, especially the underside one, where it produces more webbing and causes yellow chlorotic spots of the lamina. Heavy infestation causes leaves to turn brown and die, lowering yields and weakening plants[11,18,19]. Dar *et al.*[20,21] reported a *Tetranychus* sp. in mulberry gardens of Kashmir, Valley, India emerging as another bottleneck for good quality and quantity of mulberry leaves.

For developing any pest management programme for specific agro-ecosystem information on abundance and distribution of pest in relation weather parameters is the basic requirement[22]. The study of agricultural meteorology in relation to insect/non-insect will be very useful to the farmers in all areas were major insect or non-insect pests are appearing year after year and causing serious damage to crops. Injuries by *T. turkestani* and role played by weather parameters in their proliferation have not been reported on mulberry in India. In this background, the current study was aimed at evaluating the influence of weather parameters on the seasonal infestation (mite incidence) dynamic and on the severity of damages caused by *T. turkestani* on mulberry, in Kashmir during 2011-12 cropping seasons. At the same time, a simpler pest measuring and damage assessing techniques for mite damage on mulberry leaves was going to be developed and set up.

MATERIALS AND METHODS

Observations were made from May-October during 2011 and 2012 on mulberry plantations of four commercial varieties viz., Goshoerami, KNG, Tr10 and Ichinose, established at 0.9 m spacing either way in a plot of 25 m^2 maintained as dwarf plantation for silkworm rearing at Central Sericulture Research and Training Institute, Pampore (33°59'50" N, 74°55'05" E, 1,574 m altitude), Jammu and Kashmir (India)[23]. All plots have same exposure to the sunlight and standard agronomic practices were followed for a dwarf mulberry plantation[24,25].

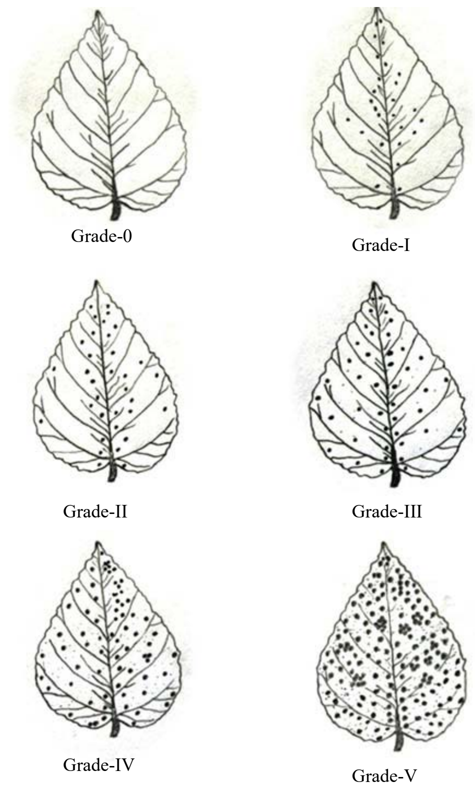
The mite presence and injury were measured from 5 plants of each variety (one plant from each corner of plot avoiding to sample the border row plants and one from the centre of each plot) selecting five branches from each plant and 10 fully opened leaves from the tip of each branch randomly. The field inspections were made each 2 weeks from May-October during 2011 and 2012 cropping seasons. The damage was measured based on the number and distribution of chlorotic spots on the leaf lamina and modifying previous methods of disease damage assessment on mulberry (Plate 1)[20,26-29]. Mite incidence (MI) and severity of damages (Percent Damage Index-PDI) were computed by adopting standard procedures[7,30]:

$$\text{Mite incidence (MI) (\%)} = \frac{\text{No. of infested leaves}}{\text{Total number of observed leaves}} \times 100$$

$$\text{Damage index (PDI) (\%)} = \frac{\text{Grade rating} \times \text{Relevant grade}}{\text{Total no. of observed leaves} \times \text{Highest grade}} \times 100$$

Data on weather parameters (i.e., temperature, relative humidity and rainfall) were obtained from the automatic weather station (WatchDog® 2700, Spectrum Technologies, Illinois, United States of America) of the Institute during the study period.

Statistical analysis: The influence of the prevailed weather parameters on the incidence and severity of mite infestation was evaluated at each field inspection by deploying the Pearson correlation and multiple regression analysis using Sigma stat 3.5® software, on the data coming from the two close fortnight inspections. Weather conditions prevailed during 15 days prior to the inspection were referred to SFN (Same fortnight) and those prevailed during 16-30 days prior to the inspection was indicated as PFN (Previous fortnight).



Grade-0	No infestation	
Grade-I	<5%	Leaf lamina infested with mite injury
Grade-II	5-10%	Leaf lamina infested with mite injury
Grade-III	10-25%	Leaf lamina infested with mite injury
Grade-IV	25-50%	Leaf lamina infested with mite injury
Grade-V	>50%	Leaf lamina infested with mite injury

Plate 1: Pictorial representation of damage grade scale for mite incidence and severity

RESULTS

Incidence and severity of *T. turkestani*: *Tetranychus turkestani* sucks the cell sap of mulberry leaves, making pin holes. Heavy infestations result in leaf yellowing, curling and webbing which affect the leaf appearance, texture and quality such as the photosynthetic efficiency. All four assayed commercial varieties showed considerable variation in mite incidence and severity during the study period (2011-12) (Table1). Mean mite incidence was 24.90, 24.33, 15.03 and 25.03%, respectively for Goshoerami, KNG, Tr10 and Ichinose varieties during the 1st fortnight of May. It slowly increased to maximum in the 2nd fortnight of July or 1st fortnight of August, with 56.97, 60.33, 43.33 and 59.00%, respectively for the above-mentioned varieties. Finally, it declined onwards to 33.30, 34.33, 27.40 and 37.67% a minimum during the 2nd fortnight of October, respectively. Severity (PDI) showed a similar trend and it was 5.39, 5.00, 3.20 and 6.10%, respectively for Goshoerami, KNG, Tr10 and Ichinose varieties during the 1st fortnight of May which gradually increased to a maximum of 37.43, 38.13, 26.67 and 39.80%, during the 2nd fortnight of July and remained almost similar in all the varieties up to the 2nd fortnight of August and slowly declined to a minimum of 13.53, 14.59, 10.97 and 16.53% at the end of season (October) (Table 1).

Incidence and severity levels during 2011 were relatively lower compared 2012 (Fig. 1, 2). Irrespective of variety, MI and PDI were lower in the beginning of the study (1st fortnight of May) (24.2 and 5.4%) which gradually increased to maximum during 2nd fortnight of July (58.5 and 38.6%) and showed a slow decrease to minimum at the end of study (2nd fortnight of October) (39.8 and 15.6%) (Fig. 1, 2). During 2012, MI and PDI followed same trend and was 20.5 and 4.4% in the beginning of the study which gradually went on increasing and reached maximum of 49.8 and 31.8% during 2nd fortnight of July and decreased to

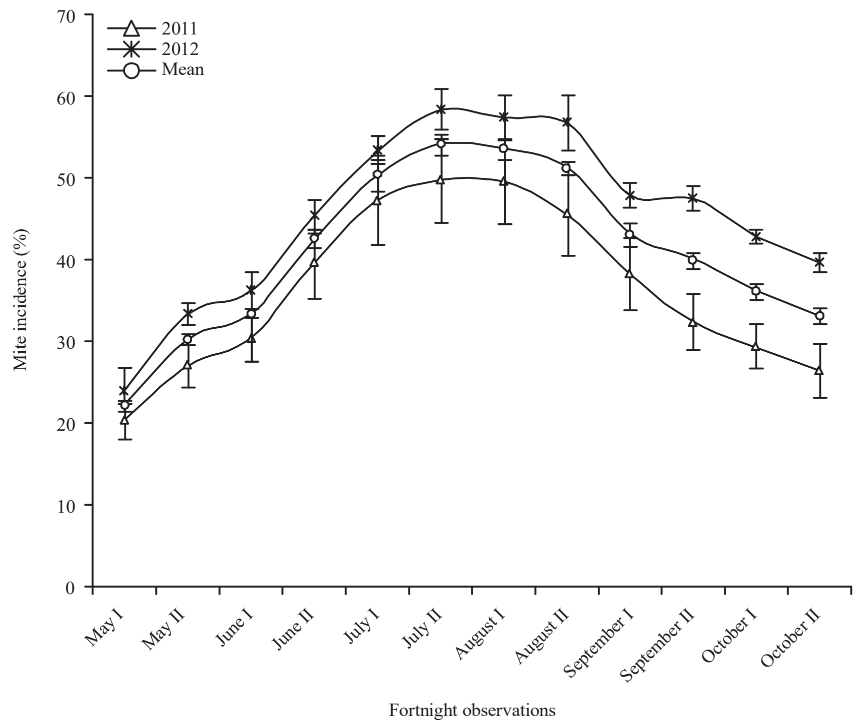


Fig. 1: Mite incidence (MI) of *T. turkestani* on mulberry at Pampore, Kashmir and India during 2011-2012

Table 1: Fortnightly observations of Mite Incidence (MI) and Percent damage index (PDI) of *T. turkestani* on popular varieties of mulberry at CSR and TI, Pampore during 2011-12

	Mulberry varieties (Mean±SE*)									
	Goshoerami		KNG		Tr10		Ichinose		Mean	
Observations 2011-12	MI	PDI	MI	PDI	MI	PDI	MI	PDI	MI	PDI
I May	24.90±2.36	5.39±0.54	24.33±1.33	5.00±0.40	15.03±1.00	3.20±0.27	25.03±1.21	6.10±0.47	22.32±2.44	4.92±0.62
II May	30.67±2.71	7.14±0.49	32.33±1.25	10.08±0.85	24.67±1.94	6.26±0.82	33.67±1.70	8.47±0.45	30.33±1.99	7.99±0.83
I June	34.67±2.71	14.33±1.41	35.00±2.36	14.93±2.30	26.00±1.70	9.54±0.59	38.00±2.26	17.37±1.45	33.42±2.58	14.07±1.62
II Jun	41.93±3.26	19.30±0.74	46.20±2.98	20.06±1.68	34.00±3.09	13.41±1.11	48.33±2.87	21.40±1.53	42.62±3.17	18.54±1.77
I July	52.00±2.45	29.80±2.66	55.00±2.36	31.87±2.82	40.00±3.59	21.13±2.75	54.67±2.26	31.53±2.35	50.42±3.54	28.58±2.52
II July	54.33±2.36	37.43±3.14	60.33±1.70	38.13±3.58	43.33±2.49	25.33±1.95	58.67±1.25	39.80±1.75	54.17±3.83	35.17±3.32
I August	56.97±2.68	34.70±2.58	55.67±2.71	35.43±1.62	42.97±3.43	26.67±2.50	59.00±3.33	36.60±2.06	53.26±3.70	33.35±2.26
II August	50.00±2.26	34.40±2.26	58.03±2.71	39.87±2.71	40.00±2.71	25.50±2.71	57.00±2.36	38.53±2.36	51.26±4.16	34.57±3.24
I September	42.97±3.70	28.33±2.38	47.67±2.36	30.13±1.94	35.33±3.56	21.63±2.73	46.67±2.49	28.83±1.77	43.16±2.80	27.23±1.90
II September	40.90±3.83	25.07±1.97	42.97±2.14	25.41±1.31	33.00±3.05	17.67±2.01	43.33±2.26	25.50±1.65	40.05±2.41	23.41±1.92
I October	35.33±2.45	19.34±1.45	38.30±1.63	18.93±1.73	32.00±1.70	12.69±0.96	39.30±3.48	21.53±2.24	36.23±1.64	18.12±1.90
II October	33.30±2.28	13.53±0.60	34.33±3.40	14.59±1.09	27.40±2.44	10.97±0.59	37.67±2.98	16.53±1.39	33.18±2.14	13.91±1.16
Mean	41.50±2.99	22.40±2.84	44.18±3.66	23.70±2.94	32.79±2.01	16.17±2.09	45.11±3.29	24.35±3.04	40.89±2.81	21.66±1.92

MI: Mite incidence, PDI: Pest damage index, SE: Standard error

26.5 and 12.2% at last observation (2nd fortnight of October) which coincided with the onset of leaf fall (Fig. 1, 2).

Influence of weather parameters on MI and PDI: Present study with mulberry at CSR and TI, Pampore revealed that the mite infestation has a clear seasonal variation in response to weather changes. Majority of weather parameters positively influenced both the incidence and severity of *T. turkestani* (Fig. 3, Table 2). Significant/highly significant and positive correlations between MI and PDI on all four varieties with maximum temperature, minimum temperature and relative humidity of same fortnight weather were noticed. Rainfall showed non-significant positive correlations and rainy days showed non-significant negative correlation. On all the four mulberry varieties both incidence (MI) and severity (PDI) registered highly significant positive correlations with

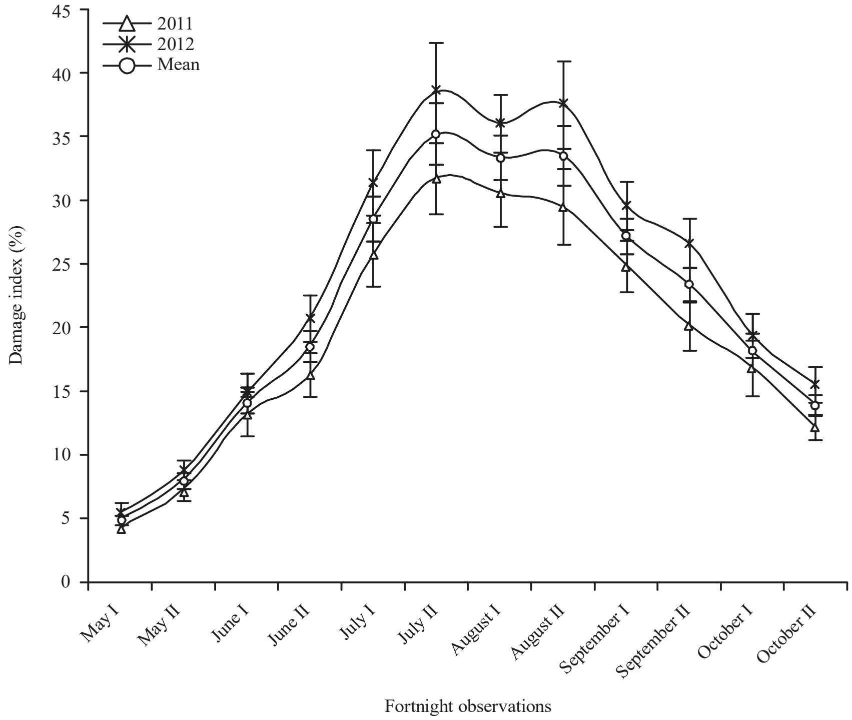


Fig. 2: Severity (PDI) of *T. turkestani* on mulberry at Pampore, Kashmir and India during 2011-2012

Table 2: Correlation of weather parameters with incidence and severity of *T. turkestani* on mulberry during 2011-12 at Pampore, Kashmir and India

			Weather parameters				
Mulberry variety	Parameters	Weather period	T_{min}	T_{max}	RF	RD	RH
Goshoerami	MI	SFN	0.79**	0.70*	0.57	-0.15	0.68*
		PFN	0.84**	0.90**	0.09	-0.41	0.34
	PDI	SFN	0.74**	0.63*	0.55	-0.15	0.78**
		PFN	0.89**	0.90**	0.23	-0.43	0.54
KNG	MI	SFN	0.81**	0.73**	0.47	-0.17	0.69*
		PFN	0.84**	0.89**	0.15	-0.45	0.37
	PDI	SFN	0.77**	0.66*	0.51	0.15	0.78**
		PFN	0.89**	0.90**	0.26	-0.45	0.53
Tr10	MI	SFN	0.71**	0.64*	0.46	-0.17	0.67*
		PFN	0.81**	0.90**	0.04	-0.53	0.36
	PDI	SFN	0.74**	0.61*	0.60*	-0.12	0.83**
		PFN	0.90**	0.91**	0.23	-0.46	0.55
Ichinose	MI	SFN	0.79**	0.71**	0.48	-0.19	0.66*
		PFN	0.81**	0.89**	0.10	-0.44	0.31
	PDI	SFN	0.73**	0.63*	0.51	-0.18	0.75**
		PFN	0.87**	0.89**	0.23	-0.44	0.50
Mean	MI	SFN	0.79**	0.71**	0.50	-0.17	0.68*
		PFN	0.83**	0.91**	0.10	-0.46	0.35
	PDI	SFN	0.75**	0.64*	0.55	-0.15	0.78**
		PFN	0.89**	0.90**	0.23	-0.44	0.53

*,**Significant at p = 0.05 and p = 0.01, respectively, MI: Mite incidence, PDI: Percent damage index, T_{min}: Minimum temperature, T_{max}: Maximum temperature, RF: Rainfall, RD: No. of rainy days, RH: Relative humidity, SFN: Same fortnight, PFN: Previous fortnight

minimum and maximum temperature of previous fortnight weather while relative humidity and rainfall showed positive and non-significant correlation. With rainy days both MI and PDI registered non-significant negative correlations on all the four mulberry varieties with previous fortnight weather (Table 2).

Multiple regression modules with 5 weather parameters of same fortnight and previous fortnight had significantly

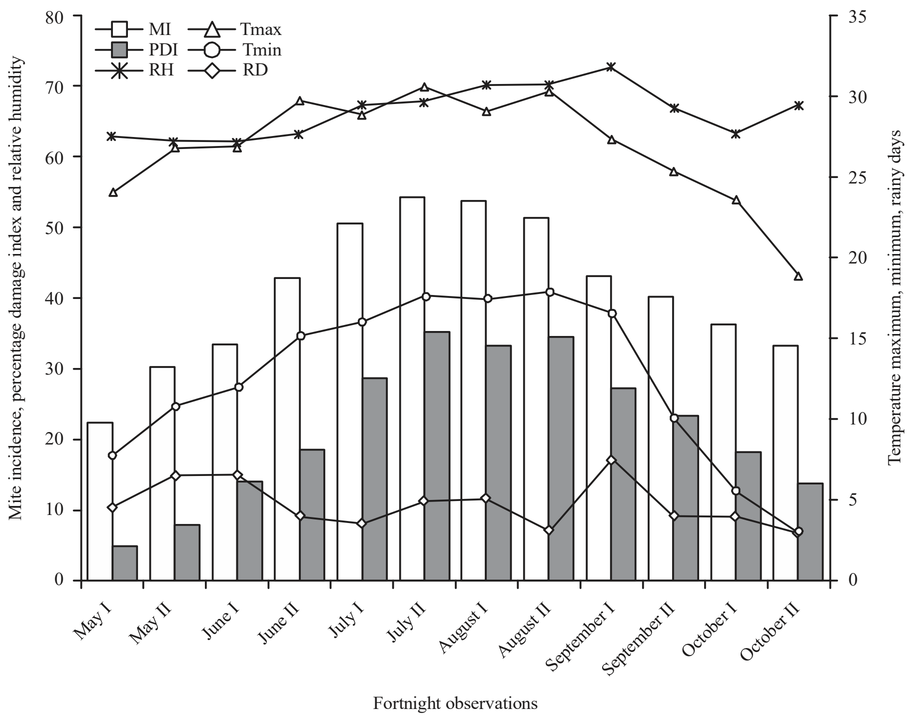


Fig. 3: Variation of incidence (MI) and severity (PDI) of *T. turkestani* on mulberry at Pampore, Kashmir and India during 2011-2012

Table 3: Multiple linear regression modules for mite incidence (MI) and severity (PDI) on different varieties of mulberry with weather parameters of same fortnight and proceeding fortnight during 2011-'2012 at Pampore, Kashmir and India

Variety			Module	R	R^2 (%)	Adjusted R^2	F-value	p-value
Goshoerami	MI	SFN	$-65.756-2.656RD+0.192\ Rf+1.039\ RH-0.0633\ T_{min}+1.765\ T_{max}$	0.921	84.8	72.2	6.709	0.019*
		PFN	$69.666\ -1.211RD+0.0581RF-1.018RH+1.834T_{min}+0.751T_{max}$	0.915	83.8	70.2	6.190	0.02*
	PDI	SFN	$-283.288-1.264\ RD+0.069\ Rf+3.046\ RH-2.919\ T_{min}+\ 5.402\ T_{max}$	0.934	87.2	76.6	8.184	0.021*
		PFN	$1.506-1.774RD+0.0830RF-0.186RH+1.628T_{min}+0.711T_{max}$	0.936	87.6	77.3	8.480	0.01*
KNG	MI	SFN	$-189.312-1.837RD-0.0285\ Rf+2.316\ RH-1.281T_{min}+3.933\ T_{max}$	0.943	89.0	79.8	9.679	0.008**
		PFN	$131.499-2.776RD+0.195RF-1.606RH+2.770T_{min}-0.281T_{max}$	0.930	86.6	75.4	7.730	0.01*
	PDI	SFN	$-297.33-1.259RD+0.0201Rf+3.251\ RH-2.792\ T_{min}+5.448\ T_{max}$	0.957	91.6	84.6	13.067	0.004**
		PFN	$19.919-2.515RD+0.231RF-0.538RH+1.511T_{min}+0.996T_{max}$	0.950	90.3	82.2	11.150	0.01*
Tr10	MI	SFN	$-179.090-1.035\ RD+0.0117Rf+2.063\ RH-1.940\ T_{min}+3.883\ T_{max}$	0.873	76.3	56.5	3.854	0.066
		PFN	$-2.795-1.256RD+0.0460RF-0.195RH+0.383T_{min}+1.811T_{max}$	0.917	84.1	70.8	6.330	0.02*
	PDI	SFN	$-187.790-0.969\ RD+0.0757\ Rf+2.131\ RH-1.697\ T_{min}+3.238\ T_{max}$	0.953	90.9	83.3	11.996	0.004**
		PFN	$-26.161-1.272RD+0.0963RF+0.0514RH+0.549T_{min}+1.332T_{max}$	0.949	90.1	81.8	10.890	0.01*
Ichinose	MI	SFN	$-104.641-2.386\ RD+1.534\ Rf+1.534\ RH-0.209\ T_{min}+2.278\ T_{max}$	0.918	84.2	71.1	6.412	0.021*
		PFN	$63.571-1.652RD+0.196RF-1.186RH+1.157T_{min}+1.801T_{max}$	0.917	84.0	70.7	6.310	0.02*
	PDI	SFN	$-271.202-1.585\ RD+0.0459\ Rf+2.977\ RH-2.657\ T_{min}+5.147\ T_{max}$	0.926	85.7	73.8	7.198	0.016*
		PFN	$-6.742-1.953RD+0.192RF-0.316RH+0.952T_{min}+1.662T_{max}$	0.922	85.0	72.4	6.780	0.019*
Mean	MI	SFN	$-134.700-1.979\ RD+0.0538\ Rf+1.738\ RH-0.873\ T_{min}+2.965\ T_{max}$	0.919	84.4	71.5	6.512	0.021*
		PFN	$65.485-1.724RD+0.124RF-1.001RH+1.536T_{min}+1.020T_{max}$	0.923	85.1	72.7	6.859	0.018*
	PDI	SFN	$-259.904-1.269\ RD+0.0529\ Rf+3.852\ RH-2.516\ T_{min}+4.809\ T_{max}$	0.944	87.1	80.0	9.795	0.008**
		PFN	$-2.869-1.878RD+0.151RF-0.247RH+1.160T_{min}+1.175T_{max}$	0.941	88.5	78.8	9.200	0.009**

*,**Significant at p = 0.05 and p = 0.01, respectively, MI: Mite incidence, PDI: Percent damage index, RD: No. of rainy days, Rf: Rainfall, RH: Relative humidity, T_{min}: Minimum temperature, T_{max}: Maximum temperature, SFN: Same fortnight, PFN: Previous fortnight

higher probability and reliable R^2 values for both incidence and severity on all the four varieties (Table 3).

DISCUSSION

Anthropogenic and natural climatic variations are insatiably influencing the arthropods with the progression of time. Certain variables like thermal effect is changing the status of the pest by smothering or invigorating genetic potential, rate of fecundity and mortality and range of host[31,32]. An understanding of the interactions between mite pest severity, temperature, relative humidity and rainfall would help in evolving suitable pest control strategies. Mites showed a high degree of variation in damage to mulberry leaves with respect to the environmental conditions besides host factors. Khanjani *et al.*[33] reported that *T. turkestani* under favorable conditions can produce nearly 20 generations a year on melon plants. Both incidence (MI) and severity (PDI) were relatively higher during 2012 than 2011. But, the trend of pest incidence and severity remained the same during both the years of study. In the beginning of study, MI (20.48%) and PDI (4.42%) were lower during 2011 than MI (24.17%) and PDI (5.42%), during 2012. During the 2nd fortnight of July, the peak was noticed for both, MI and PDI and started to decline from August onwards during both the experimental years, although the incidence as well as severity was higher during 2012 than 2011. This may be due to a positive stronger association with the maximum temperature and negative association with minimum to a relatively lower extent. Multi-climatic factors particularly temperature can extend or reduce the life cycle of insects[32] impart support to current study. Population of the *T. turkestani* increased in June and July and reached to maximum on 24 July on cotton[34] also lend support to the current findings. Study clearly revealed that mite infestation had a clear seasonal variation in response to climatic changes. It was observed that average temperature of 25°C and above coupled with morning relatively humidity of 70% and above favoured the multiplication of mites leading to gradual increase in mite infestation and damage from May-August which slowly decreased to a minimum in October with the reduction in temperature and humidity. Weather controls the development rate, survival and level of activity of the insect[35] lends support to the current findings. Both incidence and severity varied with respect to variety and years and were highest in KNG and Ichinose varieties during 2011 but, during 2012, Goshoerami and KNG registered higher MI and PDI. Current results are in close conformity with that of Khederi *et al.*[36] where, *T. turkestani* showed some variation among melon genotypes with respect to adult density on leaves. This mite strongly preferred Honey Dew and Bargney than CMI-167, Samsoori and Ananasi genotypes than other genotypes. Similarly, in the present study, KNG poorly supported mite population build-up but, recorded higher PDI and seems to be highly susceptible/sensitive to *T. turkestani* among the four varieties which needs to be investigated as this is a variety preferred for young age silkworm rearing[37]. Of course, the influence of climate and agronomy still hold a share as Ichinose and Goshoerami did not confirm the MI and PDI in response to population build-up besides host plant factors. At the same time, Tr10 being a good supporter of mite population build-up during both the years showed some amount of tolerance to mite damage with relatively lower MI and PDI values may be a dependable variety of mulberry under mite outbreak situations to sustain silkworm production. Current results are in close conformity with that of Dar *et al.*[21], who observed highest values for MI and PDI in Goshoerami variety of mulberry. Weather parameters viz., maximum temperature, minimum temperature and relative humidity of same fortnight and previous fortnight positively influenced the incidence and severity of mites. Highly significant and positive correlation existed between mite incidences and temperature irrespective of mulberry varieties. Relative humidity and rainfall of PFN showed positive but non-significant correlation, while rainy days showed non-significant negative correlation. Severity on all the four mulberry varieties showed highly significant positive correlation with maximum temperature, minimum temperature and relative humidity of SFN weather whereas non-significant positive correlations with relative humidity and rainfall of PFN. With rainy days, severity registered non-significant negative correlations on all the four mulberry varieties during 2011-12. This indicated that the weather variables of SFN and PFN in relation to MI and DPI are critical for pest build-up. Influence of weather factors dominated over the reaction of mulberry varieties clearly illustrates their influence on mite pest build-up. Mite damage is more governed by the varieties over and above the weather influence. Similar results were documented by Ramegowda *et al.*[7] for lesser mulberry pyralid, *G. pyloalis* and mulberry looper, *H. atrilineata* on mulberry in Kashmir valley and lend support to the current studies as they observed that both pest incidence and severity were dependent of climatic factors. Rajalakshmi *et al.*[8] reported that the average maximum temperature of 25°C and above with relative humidity of 70% and above, favored the multiplication of mites and hence the total population shot up very fast in May/June on mulberry. From October onwards average minimum temperature fell below 20°C and hence the population started declining. Similar reports are available with many other species of mites on many agriculture and horticulture crops in India and abroad[38].

Multiple regression modules comprising of five weather parameters of both SFN and PFN weather had significantly higher probability and reliable R^2 values for both mite incidence and severity caused by *T. turkestani* on all varieties but, in case of Tr10 variety although there was reliable R^2 values but, the probability is not significant for incidence with same fortnight weather. Non-significant regression of weather factors with Tr10 variety of mulberry with mite population and damage intensity hints clear role of plant factors in pest build up and damage intensity. The average of mite incidence and severity, irrespective of the varieties too registered higher probability and reliability. Ramegowda *et al.*[7] observed that multiple regression modules showed reliable R^2 and higher probability for both *G. pyloalis* and *H. atrilineata* with weather parameters in mulberry gardens of Kashmir valley, India.

CONCLUSION

The ultimate aim of sericulture is to produce a sustained economic yield of crop for silkworm and current study concludes that *T. turkestani* is a serious pest to mulberry foliage, causing severe damage to its quality and quantity with respect to the weather conditions. Efforts should be made to deal with their incidence and severity by using eco-friendly and cost-effective methods. The outcome of this study will serve as a guide to the farmers when planning for their silkworm crop.

SIGNIFICANCE STATEMENT

Influence of weather parameter on strawberry spider mite, *Tetranychus turkestani* population incidence and damage to leaves of four commercial mulberry varieties viz., Goshoerami, KNG, Tr10 and Ichinose at Pampore, Kashmir, India has provided a clear picture that, positive influence of temperature and relative humidity prevailed over a month's period has enhanced the damage significantly while, the negative impact of rainy days and rainfall was not significant. This has to be kept in mind while planning for summer and autumn rearing of silkworm in the Kashmir valley.

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