



Thrips species composition on grapes in Karnataka and Maharashtra

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ABSTRACT

A survey was undertaken to document species composition of thrips on grape foliage, inflorescence and different stages of berry development such as mustard size (2 mm), sorghum size (4 mm), pea size (8 mm) and beyond pea size (> 8 mm) berries at Bijapur in Karnataka and Sangli in Maharashtra during January 2005 to January 2006. Cultivars sampled were *Thomson Seedless*, *Sonaka*, *Sharad Seedless*, *Tas-A-Ganesh*, 2A and B5 clones of *Thomson seedless*. *Scirtothrips dorsalis* Hood constituted over 90% of total thrips sampled from new flushes, inflorescence and berries in different stages during January, February, March and December 2005 at Bijapur followed by *Thrips palmi* Karny (1- 4.3%); *Thrips hawaiiensis* (Morgan) a hitherto unknown thrips species on grape dominated inflorescence (98.0%) on cv. *Sonaka* during December 2005 in the same area. Similar trend was observed in the vineyards of Sangli. Number of thrips, which was more on inflorescence declined as the berry matured. Least number of thrips was observed on berries > pea size. As recorded in Bijapur, *T. hawaiiensis* was dominant species on inflorescence of 2A (98.6%) and B5 (99.4%) clones of *Thompson seedless*. In other cultivars *S. dorsalis* was dominant that formed 92.8 -100% of total thrips collected. *Thrips palmi* constituted 0.8-1.7% of thrips collected from different parts of grape vine. Other unidentified thrips constituted 0.9-7.2%.

Key words: Inflorescence, *Scirtothrips dorsalis*, *Thrips hawaiiensis*, grapevine

Pests and diseases are major limitations for successful cultivation of grapes. As many as 94 species of insects and mites have been reported on grapes in India (Tandon and Verghese, 1994). Among various sucking pests, thrips are considered serious on grapes (Anon., 2000). *Rhipiphorothrips cruentatus* Hood and *Scirtothrips dorsalis* Hood (Thysanoptera: Terebrantia: Thripidae) were recorded infesting leaves and berries in India (Ananthakrishnan, 1971, Butani, 1979, Verghese and Kamala Jayanti 2001). The scab caused by thrips on fruit reduces quality and marketability. The present study was taken up to assess and status of different thrips species on foliage, inflorescence and at different stages of berry development.

Location of survey and cultivars: Bijapur (Karnataka) and Sangli (Maharashtra), about 122 km away from Bijapur categorized under hot tropical region (between 15^o and 20^o N Longitude) are known for grape cultivation. Hence, these places were surveyed for thrips species between January 2005 and January 2006. All vines were pruned in September-October and subjected to different insecticides and fungicide treatment. Eight orchards during January, March and

December 2005 and 11 orchards in February 2005 were surveyed at Bijapur (*Thomson Seedless*, *Sonaka*, *Sharad Seedless*). In Sangli 13 orchards were surveyed during January 2006 (*Thomson Seedless*, *Tas-A-Ganesh*, 2A & B5 clones of *Thomson seedless*)

Sample: In January and December 2005 (Bijapur), fresh foliage, inflorescence and maturing fruit bunches (mustard size (2mm), sorghum size (4 mm), pea size (8 mm) and beyond pea size (> 8 mm berries) were sampled. In February 2005, out of 11 orchards 10 orchards had fruit bunches with pea size and > pea size berries and remaining one had sorghum size, pea size and > pea size berries. During March grape vines had bunches only with berries > pea size, Fresh foliage/ inflorescence (Bloom)/ fruit bunch in five randomly selected vines in each location were tapped twice over black paper using a stick (50 cm long). While sampling fruit bunches, bunches with mustard size (2 mm), sorghum size (4 mm), pea size (8 mm) and > pea sized berries (> 8 mm) were separately sampled. Thrips fallen on the black paper placed below were collected using a fine brush and transferred into 2 ml vials containing a mixture of 70% ethyl

alcohol, acetic acid (9:1 v/v) and 0.5ml Triton x 100. Each vial was labeled (sampling date, locality, cultivar sampled, part sampled etc.). Thrips in each vial were counted under a stereo-binocular microscope and slide mounts were prepared. Process consisted of clearing thrips (after giving a slant cut on the first two segments of the abdomen) in NaOH 5% for 7-8 h depending upon pigmentation, washed in distilled water, dehydration using grades of ethyl alcohol, clearing in Terpeneol and mounting on clean slides (2 mm thick) using Canada balsam (Natural) mountant. Species were determined as per key provided by Vikas Kumar (2004)

In January 2005 and December 2005 at Bijapur all surveyed orchards had all stages of the crop. While February and March showed maturing berries (different stages), mainly pea size (8 mm). At Sangli, orchards had stages from inflorescence to berries beyond pea size during January 2006.

Results revealed that *S. dorsalis* dominated new flushes, inflorescence, and all stages of berries in a fruit bunch. However, fruit bunches beyond pea size harboured thrips in low number (1-28 thrips/bunch) and the number declined as the berries matured.

Bijapur: *Scirtothrips dorsalis* constituted over 90% of total thrips sampled from new flushes, inflorescence and berries in different stages during January, February, March and December 2005, followed by *T. palmi* Karny (1- 4.3%) (Tables 1, 2 and 3). *Thrips hawaiiensis* Hood a hitherto unknown thrips species on grape was observed to dominate inflorescence on cv. *Sonaka* during December 2005. *Thrips hawaiiensis* formed 98.0% of total thrips counted on inflorescence (Table 4). However, sampling inflorescence of other cultivars during December did not show *T. hawaiiensis*, which needs to be rechecked. Number of thrips was maximum on inflorescence that declined as the

Table 1. Incidence of grape thrips at different locations in Bijapur (January 2005)

Location	Variety	Area(Acre)	No. of thrips collected out of 2 tapings					
			New foliage	Inflor.	Millet size	Sorghum size	Pea size	> Pea size
Thidugundi	TS	5	16.7	87.2	12.5	12.7	6.0	2.5
Kadlivada	TS	10	27.2	118.1	27.3	10.4	12.0	10.2
Kadlivada	SS	4	36.5	127.2	47.1	29.4	10.0	8.2
Segunasi	TS	2	37.3	112.7	60.2	32.6	23.1	18.5
Bableshwar	TS	2	48.1	93.6	44.2	12.6	10.1	3.2
A. Tanda	TS	5	21.7	86.6	31.2	27.1	18.6	4.3
Zalki	TS	2	18.2	14.2	96.8	41.6	37.1	10.5
Galagali road	TS	3	23.8	56.7	61.9	72.3	45.6	12.6

TS- Thomson Seedless, SS- Sharad Seedless

S. dorsalis ranged from 90-98.4% of total thrips collected in all plant parts sampled

Table. 2 Incidence of grape thrips at different locations in Bijapur (February 2005)

Location	Variety	Area(Acre)	No. of thrips collected out of 2 tapings					
			New foliage	Inflor	Millet size	Sorghum size	Pea size	> Pea size
Kadlivada	TS	10	6.3	—	—	—	2	0
Kadlivada	SS	4	12.2	—	—	—	6	1
Bableshwar	TS	2	8.6	—	—	—	16	3
Bableshwar	TS	2	14.8	—	—	8.9	4	0
Bijapur- Aurangabad road	TS	2	6.5	—	—	—	7	4
A. Tanda	TS	2	18.4	—	—	—	—	4.3
Zalki	TS	3	17.5	—	—	—	—	1
Tajpur	TS	2	11.2	—	—	—	—	18
Galagali Road	TS	4	23.6	—	—	—	—	47
Aliabad	TS	2	7.8	—	—	—	—	28
	TS	3	3.1	—	—	—	—	22.5

TS- Thomson Seedless, SS- Sharad Seedless

Species of thrips identified: New foliage: *Scirtothrips dorsalis*, *Thrips palmi*

Inflorescence: *Scirtothrips dorsalis*, *T. palmi*

Millet size berry- *S. dorsalis*

Sorghum size berry- *S. dorsalis*

Pea size berry- *S. dorsalis*

Table 3. Incidence of grape thrips at different locations in Bijapur (March 2005)

Location	Variety	Area(Acre)	No. of thrips collected out of 2 tapings					
			New foliage	Inflor	Millet size	Sorghum size	Pea size	> Pea size
Bableshwar	TS	2	8.7	—	—	—	—	2.6
Bableshwar	TS	1	2.7	—	—	—	—	0
Aliabad	TS	1	7.6	—	—	—	—	0
Trikota	TS	2	12.5	—	—	—	—	2
Thidugundi	TS	2	3.7	—	—	—	—	2.5
A. Tanda	TS	1	8.3	—	—	—	—	5.2
Kadlivada	TS	10	2.5	—	—	—	—	2.6
Kadlivada	SS	4	6.8	—	—	—	—	1.5

TS- Thomson Seedless, SS- Sharad Seedless

Species of thrips identified: New foliage: *Scirtothrips dorsalis*, *Thrips palmi*

Inflorescence: *Scirtothrips dorsalis*, *T. palmi*

Millet size berry- *S. dorsalis*

Sorghum size berry- *S. dorsalis*

Pea size berry- *S. dorsalis*

Table 4. Incidence of grape thrips at different locations in Bijapur (December 2005)

Location	Variety	Area(Acre)	No. of thrips collected out of 2 tapings					
			New foliage	Inflor	Millet size	Sorghum size	Pea size	> Pea size
Bableshwar	TS	5	52.2	82.7	21.2	27.8	5.8	6.2
Bableshwar	SK	2	26.0	42.8*	27.6	10.3	2.0	—
Ayeri	TS	2	46.5	-	-	16.2	6.2	—
A. Tanda	TS	5	23.4	66.4	50.8	32.1	10.2	-
Thidugundi	TS	2	21.5	42.6	36.8	21.7	16.2	6.3
Thidugundi	TS	1	17.2	96.5	54.2	36.4	14.8	—
Jumnal	TS	2	22.5	58.2	45.5	39.6	8.8	-
Segunasi	TS	2	16.9	76.3	32.7	221.5	—	—

TS- Thomson Seedless, SK- Sonaka

Dominant species of thrips identified: New foliage: *Scirtothrips dorsalis*, *Thrips palmi*

Inflorescence: *Scirtothrips dorsalis*, *T. palmi*

Millet size berry- *S. dorsalis*

Sorghum size berry- *S. dorsalis*

Pea size berry- *S. dorsalis*

* *Thrips hawaiiensis* constituted 98 % of the thrips collected on inflorescence

berries matured. Other unidentified thrips formed 0.5 to 7% of the thrips collected from January to March and December 2005.

Sangli: Similar trend was observed in the vineyards of Sangli. Number of thrips was maximum on inflorescence that declined as the berry matured. As observed in Bijapur, *T. hawaiiensis* was dominant species on inflorescence (cv. *Sonaka*) (Table 5). The same species shared 98.6% and 99.4% of thrips collected on inflorescence but on 2A and B 5 clones of *Thomson Seedless*, respectively in 2 different orchards at Tasgaon. In other cultivars viz, *Thompson Seedless* and *Tas-a- Ganesh*, *S. dorsalis* was dominant that formed 92.8 -100% of total thrips collected. *Thrips palmi* constituted 0.8-1.7% of thrips collected from different parts of grape vine. Other unidentified thrips constituted 0.9-7.2%. Harish (2000) observed that number of *S. dorsalis* was maximum in the vegetative and flowering

stages (cv. *Bangalore blue*) as compared to berry maturation period in winter and summer pruned vines. However, number of thrips declined as the berry matured. In the present study also the number of thrips was maximum at inflorescence stage (Bloom) and declined as the berry matured on different cultivars. Schwartz (1988) recorded maximum number of *T. tabaci* Lindeman in blossom stage in South Africa. Similarly, Ripa *et al* (1993) reported colonization of *T. tabaci* during anthesis and nymphs fed on pollen and internal tissues of calyptra. Ananthkrishnan (1971) observed infestations of *S. dorsalis* on flower bunches and young berries of grapes resulting in reduced fruit set and development of corky layers and cracks on the surface of fruits.

Rose is widely grown in Sangli. Rose flowers sampled in adjoining fields of grape orchards at two locations, Tasgaon and Savlaz showed severe infestation by *T.*

Table 5. Survey for thrips of grapes in Sangli (January 2006)

Location	Variety	Area(Acre)	No. of thrips collected out of 2 tapings					
			New foliage	Inflor	Millet size	Sorghum size	Pea size	> Pea size
Kawlapur	TS	2	12.6	30.7	23.6	7.3	10.6	3.2
Kawlapur	Sonaka	1	52.3	-	-	74.2	-	-
Tas gaon	TS*	1	10.6	87.4	10.2	8.6	3.6	-
Tas gaon	TS*	2	22.6	45.6	27.1	18.2	11.6	-
Savlej	TS	4	23.1	58.6	27.1	18.6	20.6	11.3
Savlej	TAG	1	6.7	-	-	25.6	11.5	12.7
Savlej	TS	3	43.2	-	-	56.2	35.5	-
Savlej	TS**	1	23.5	85.2	69.6	48.1	-	-
Khanapur	TAG	4	26.5	-	-	19.2	17.6	-
Khanapur	Sonaka	4	18.7	-	-	43.4	24.6	-
Biranwadi	TAG	2	38.6	-	-	25.4	12.8	-
Balaudi	TS	5	88.5	136.2	87.5	87.2	41.2	-
Manerajouri	TS*	2	79.3	116.7	79.4	66.5	47.8	-

S- Sonaka, TS- Thomson Seedless, TS*- 2A clone of Thomson Seedless, TS**- B5 clone of Thomson Seedless, TAG- Tas- a- Ganesh

* *T. hawaiiensis* constituted 98.6% of the total thrips counted in inflorescence

** *T. hawaiiensis* constituted 99.4% of the total thrips counted in inflorescence

hawaiiensis. It is likely that *T. hawaiiensis*, a polyphagous pest has moved to adjoining grape orchards to infest bloom. However, it is important to establish the role of *T. hawaiiensis* if any, in scaring/ scabbing of berries as damage inflicted at “bloom” brings down the quality of grapes. Further, it needs to be found out by extensive survey whether *T. hawaiiensis* cross over to cultivars other than *Sonaka* and clones of *Thompson seedless*.

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