

Regional Fruit Research Station, Abohar, India

Rachis cracking in grapes

by

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Risse in Traubenstielen

Zusammenfassung. — Bei 16 von 87 untersuchten Rebsorten traten mehr oder weniger häufig Längsrisse in den Traubenstielen auf. Die Qualität der Beeren wurde durch die Erkrankung nicht beeinflusst. Aufgrund der Befunde über den Mineralstoffgehalt der Blätter ist zu vermuten, daß die Abnormität nicht durch eine unausgewogene Ernährung, sondern durch andere Faktoren verursacht wird.

Introduction

Grape cultivation is gaining importance in India and the area under its cultivation is substantially increasing. A large collection of germ plasm has been assembled at the Regional Fruit Research Station, Abohar, with the chief objectives to evaluate locally the performance and suitability of different varieties. Preliminary observation revealed a peculiar abnormality of clusters i.e. cracking of rachis of certain varieties. The abnormality is evidenced by a swelling on the rachis which later crack longitudinally (Fig. 1). No record of such type of abnormality is known to us, hence, preliminary studies were initiated to study varietal susceptibility, its extent and effect on the quality of berries of different varieties. To see if the abnormality is due to nutritional imbalance, mineral elements in the leaves of shoots bearing healthy or cracked rachis clusters were analyzed.

Materials and Methods

A survey of 87 varieties was undertaken during the fruiting season of 1972. In each variety the number of clusters with healthy and cracked rachis were counted per vine and the extent of cracking was calculated. There were at least three to five vines in each variety under study. For quality of berries, acidity was estimated by titrating an aliquot against N/10 NaOH using phenolphthalein as an indicator and results are expressed as tartaric acid. Reducing sugars

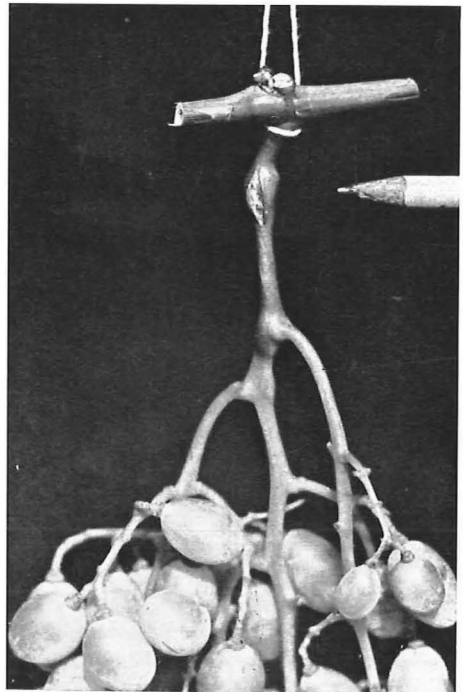


Fig. 1: Cluster of Angur Kalan exhibiting typical rachis cracking.
Traube (Sorte Angur Kalan) mit typischem Längsriß im Traubenstiel.

(mainly glucose) were estimated by the method of LANE and EYNON (1923). T.S.S. were determined by hand refractometer and values were corrected at 20 °C.

For mineral composition of leaves, leaf samples were collected from shoots of Angur Kalan and Taifi Rozovi cultivars only bearing clusters with cracked and healthy rachis separately from 4th node of fruiting shoots at the time of cluster maturity. Leaves were thoroughly washed with detergent and 1.0% HCl and finally with distilled and double distilled water. After blotting, the leaves were dried at 65 °C and ground into fine powder. N was estimated by the micro KJELDAHL method (A.O.A.C. 1970), P by molybdate vanadate method, K by flame photometer and Fe, Zn and Mn by atomic absorption spectrophotometer after digesting the material with triple acid mixture of nitric : sulphuric : perchloric acid (10 : 1 : 3). Ca and Mg were determined by EDTA titration method after double acid digestion of nitric and perchloric acid (5 : 1).

Results and Discussion

I. Varietal susceptibility and extent of cracking

Varieties were grouped into different categories depending upon the extent of cracking as follows:

Rachis cracking of grapes

- (i) Above 30% — Angur Kalan, Taifi Rozovi.
- (ii) 11—30% — Alambic, Black Muscat, Chohan special, Fakhri, Hur, Kata.
- (iii) 1—10% — Bedana, Convent large Black, Hussaini, Hussaini Black, Kabuli, Margret, Spaul, Madeleine Royal, Mukh Chalani, Nasik.
- (iv) Varieties free from rachis cracking: Anab-e-Shahi, Banquabad, Barbarossa, Beauty Seedless, Bharat Early, Bhokri, Bianshirai, Black Champa, Black Champion, Black Round, Bourvic, Buckland Sweetwater, Caparavi, Cardinal, Carignane, Charas, Chasselas, Violet, Chini No. 5, Chini No. 10, Convent large, Country Bangalore, Delight, Dutch sweet, Early Muscat, Exotic, Foster's Seedling, Gold, Golden Queen, Gros Colman, Gujranwalla, Habshi, Isabella, Jefferson, Janjal Khara, Jaos Beli, Kabarnai, Kailashpur, Kandhari, Karachi-Gulabi, Kata Kurgan, Kishmish Beli, Kishmish Charni, Lahore No. 33, Lomanto, Loose Perlette, Madeleine Angevine, Muscat, Muscat Hamburg, Muscat of Alexandria, Palomino, Pearl of Csaba, Perlette, Pirovano, President, Pusa Seedless, Ribier, Riesling, Rose M. T. Lahore, Rosea Venturiam, Sahebi, Seedless, Shadipur Local I, St. George, St. Jeannet, Suar Swai, Tas, Terana, Waltham Cross.

Table 1
Effect of rachis cracking on quality of grapes
Einfluß von Rissen in den Traubenstielen auf die Traubenqualität

Variety	Bunch weight (g)	Juice (%)	Acidity (%)	Sugar as glucose (%)	T.S.S.
Angur Kalan					
Healthy	240.4	55.3	0.87	9.52	14.1
Cracked	237.8	54.7	0.87	8.94	14.0
Taifi Rozovi					
Healthy	338	54.4	0.63	6.89	11.0
Cracked	334	54.1	0.61	6.92	11.1

Table 2

Mineral composition of leaves from shoots bearing healthy or cracked rachis
Mineralzusammensetzung der Blätter von Sprossen mit gesunden oder aufgerissenen
Traubenstielen

Variety	N %	P %	K %	Ca %	Mg %	Fe ppm	Zn ppm	Mn ppm
Angur Kalan								
Healthy	2.72	0.172	0.88	5.02	1.74	218	40	70
Cracked	2.68	0.181	0.86	4.94	1.67	209	38	71
Taifi Rozovi								
Healthy	3.22	0.195	1.14	4.74	1.81	263	35	65
Cracked	3.31	0.192	0.98	4.82	1.85	254	37	63

Of 87 varieties, only 16 were susceptible to this malady and the maximum percentage of cracking was found in Angur Kalan and Taifi Rozovi (above 30%).

II. Effect of cracking on maturity and quality of berries

Data on maturity and quality of berries revealed that there was no appreciable difference in maturity and quality of berries from clusters with cracked or healthy rachis of Angur Kalan and Taifi Rozovi cultivars (Table 1).

III. Effect of cracking on mineral composition of leaves

It is evident from Table 2 that there are no significant differences in mineral composition of the two sets of leaves. However, values observed for different elements are appreciably higher than the values of SAMISH *et al.* (1961). These differences could be due to soil, cultivar and different management factors. This malady may be due to reasons other than nutritional ones and requires further investigation.

Summary

Studies on cracking of rachis of grapes have shown that out of 87 cultivars under study, 16 were prone to it. Berry quality was not affected by the malady. Data on chemical composition of leaves suggested that the abnormality is not due to nutritional imbalance.

Acknowledgement

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