



## Change of Phytoalexins Stilbenoids of Vine Trunk Tavkveri Variety (*vitis vinifera* L.) in Condition Crown Gall Infection

M.Bezhuashvili\*

Institute of Viticulture and Oenology of the Agricultural University of Georgia, Tbilisi, Georgia.

**Corresponding author:** M.Bezhuashvili, Institute of Viticulture and Oenology of the Agricultural University of Georgia, Tbilisi, Georgia. Email: m.bezhuashvili@agruni.edu.ge

**Received date:** October 15, 2021; **Accepted date:** October 29, 2021; **Published date:** November 8, 2021

### Abstract

It is studied correlation of phytoalexin stilbenoids in Georgian red grape variety – Tavkveri stamps, healthy and infected by bacterial cancer. Reaserch examples were taken in Kartli region (east part of Georgia) Meadow Cinnamonic type of soil from 7 years old vineyards. Fractions of stilbenoids were isolated from the stamps by ethylacetate and then analyzed by HPLC/MS method. It is established content of phytoalexin resveratrol and its derivatives in healthy and infected by bacterial cancer stamps. It is carried out stress-metabolite stilbenoids compare to physiological concentration of stilbenoids with infected Stilbenoids. Among the above mentioned stilbenoids dominates trans-resveratrol, which concentration is increasing in condition of bacterial cancer diseased grapes. Received results for the vine Tavkveri are scientific novelty and important data for the correlation of the immunity of grapevine with pftytoalexin-stilbenoids.

This work was supported by Shota Rustaveli National Science Foundation of Georgia(SRNSFG)[grant number FR 17\_486].

Stilbenes are mainly involved in constitutive and inducible protection of the plant against biotic (phytopathogenic microorganisms and herbivores) and abiotic (e.g., UV radiation and tropospheric ozone) stress. On one side they counteract the aggression exerting a direct toxic effect on the pathogen, while on the other they act as antioxidants, protecting the cells from oxidative damage. Stilbenes possess several antipathogenic properties including antibacterial, antifungal, nematocidal and insecticidal. They could also act as a deterrent towards vertebrate herbivory, as a possible negative effect of stilbenes has been reported on snowshoe hares (*Lepus americanus* Erxleben) and field voles (*Microtus agrestis* L.). The role of stilbenes, among other polyphenols, in counteracting oxidative stress is just as important, as the plant response to pathogen attack involves the production of reactive oxygen species (ROS), which both act as signals for the activation of stress and defense pathways and as toxic substances capable of directly damaging the pathogen. Oxidative stress may also be induced by many abiotic conditions, such as drought, thermal stress, ultraviolet radiation, mechanical stress, heavy metals, salts, and air pollutants such as ozone. Unsurprisingly, many of these factors also affect stilbene production. Over the past 20 years, the bioactivities of stilbenes have been intensively investigated due

to their impact on human health. Among stilbenes, resveratrol is the best known and the most studied. Basic scientific research and over 240 clinical studies have demonstrated the multiplicity of trans-resveratrol pharmacological effects, including antioxidant, anti-inflammatory, anticancer, estrogenic, neuroprotective, cardioprotective, anti-atherosclerotic, anti-aging, anti-diabetic, anti-osteoporosis, and anti-obesity properties.

**Key words:** stilbenoids; phytoalexins; vine; crown gall.

### Conclusions and Future Prospects

Stilbenes are mainly involved in constitutive and inducible protection of the plant against biotic (phytopathogenic microorganisms and herbivores) and abiotic (e.g., UV radiation and tropospheric ozone) stress. On one side they counteract the aggression exerting a direct toxic effect on the pathogen, while on the other they act as antioxidants, protecting the cells from oxidative damage. Stilbenes possess several antipathogenic properties including antibacterial, antifungal, nematocidal, and insecticidal. They could also act as a deterrent towards vertebrate herbivory, as a possible negative effect of stilbenes has been reported on snowshoe hares (*Lepus americanus* Erxleben) and field voles (*Microtus agrestis* L.). The role of stilbenes, among other polyphenols, in counteracting oxidative stress is just as important, as the plant response to pathogen attack involves the production of reactive oxygen species (ROS), which both act as signals for the activation of stress and defense pathways and as toxic substances capable of directly damaging the pathogen. Oxidative stress may also be induced by many abiotic conditions, such as drought, thermal stress, ultraviolet radiation, mechanical stress, heavy metals, salts, and air pollutants such as ozone. Unsurprisingly, many of these factors also affect stilbene production. Over the past 20 years, the bioactivities of stilbenes have been intensively investigated due to their impact on human health. Among stilbenes, resveratrol is the best known and the most studied. Basic scientific research and over 240 clinical studies have demonstrated the multiplicity of trans-resveratrol pharmacological effects, including antioxidant, anti-inflammatory, anticancer, estrogenic, neuroprotective, cardioprotective, anti-atherosclerotic, anti-aging, anti-diabetic, anti-osteoporosis, and anti-obesity properties. Biosynthesis of stilbenes and environmental factors that have so far been poorly studied, such as viruses, bacteria, herbivores, UV-A, and ionizing radiation.

### References

1. Roupe, K.A.; Remsberg, C.M.; Yáñez, J.A.; Davies, N.M. Pharmacometrics of stilbenes: Seguing towards the clinic. *Curr. Clin. Pharmacol.* 2006, 1, 81–101.
2. El Khawand, T.; Courtois, A.; Valls, J.; Richard, T.; Krisa, S. A review of dietary stilbenes: Sources and bioavailability. *Phytochem. Rev.* 2018, 17, 1007–1029.
3. Chong, J.; Poutaraud, A.; Huguency, P. Metabolism and roles of stilbenes in plants. *Plant Sci.* 2009, 177, 143–155.
4. Rivière, C.; Pawlus, A.D.; Merillon, J.M. Natural stilbenoids: Distribution in the plant kingdom and chemotaxonomic interest in Vitaceae. *Nat. Prod. Rep.* 2012, 29, 1317–1333.

**Citation:** M.Bezhuashvili (2021) Change of Phytoalexins Stilbenoids of Vine Trunk Tavkveri Variety (*vitis vinifera* L.) in Condition Crown Gall Infection. *J Biodivers Manage Forestry* 10:12.

---

5. Dubrovina, A.S.; Kiselev, K.V. Regulation of stilbene biosynthesis in plants. *Planta* 2017, 246, 597–623.