

DOI No.: <http://doi.org/10.53550/EEC.2023.v29i03s.042>

# A Virus that Caused the First Financial Bubble: “Tulipmania”

Plato Basumatary<sup>1</sup>, Preeti Hatibarua<sup>1</sup> and Jangila Hazowary<sup>2</sup>

<sup>1</sup>*Department of Horticulture, Assam Agricultural University, Jorhat 785 013, Assam, India*

<sup>2</sup>*Department of Plant Pathology, Assam Agricultural University, Jorhat 785 013, Assam, India*

(Received 6 December, 2022; Accepted 10 February, 2023)

## ABSTRACT

Tulipmania is one of the first financial bubble that recorded in the history where the price of a single rare broken tulips reached to an extravagant price. The mania took place between 1634 and 1637 in Holland. The broken tulips were considered as a luxury and status item during that period. The broken tulips were caused by “Tulip breaking virus” which induced the breaking of flower colour into stripes like pattern.

*Key words* : Colour breaking, Financial bubble, Tulip, Tulip breaking virus.

## Historical background

The economic crisis occurred during the 17<sup>th</sup> century in the Holland as a result of the human passion for the tulips are known as “Tulipmania”. A financial bubble is formed when there is an increase in price of an asset over a period which is much lower than its intrinsic value and the tulipmania is considered as the first recorded financial bubble in the history. The people during the tulipmania went crazy for the tulips that they are willing to pay a large sums of price for a single tulip bulbs. However, tulips were not originated in Holland, they were originally found in the wilds of Central Asia. The cultivation of the tulips first started in Ottoman Empire (Present day Turkey). The tulips were first introduced to Europe in Vienna in 1554 by Ogier Ghislain de Busbecq, the ambassador Charles V, Hary Roman Emperor to Sultan Suliman the Magnificent. Carolus Clusius, a Dutch botanist at the University of Leiden first planted the tulip bulbs in Holland and thus became the popular flower crop of Holland. During the Dutch Golden Age the

people were fascinate for collecting expensive and luxury items and the tulips was one of them, since tulip were not indigenous to them, its beauty has become one of the luxury item and a status symbol of the wealth.



**Fig. 1.** A painting of a “Semper Augustus” tulip- most expensive tulip sold  
(Source: Wikipedia)

The mania peaked from 1634 to 1637 where the price of the rare broken tulip bulbs reached extraordinary prices. Tulips were normally of uniform colour and the breaking of colour of tulip petals were seem to be more attractive and were fascinated by the people and this act as a catalyst for the increasing demand for the rare broken tulips. The beauty, rarity, unpredictability and frailty of the broken tulip contributed to its rise as the object of collecting (Lesnaw and Ghabrial, 2000). During the mania the value of a single rare broken tulip bulb was sold at a price of about 10 times the annual income of the skilled artisans. One of the varieties that were sold was “Semper Augustus” a rare broken tulip with white streaks on the red petals (Fig 1), it was

sold for 3,000 guilders (Dash, 1999). Similarly, a variety named “Viceroy” (Fig 2) sold for 2,500 guilders.

According to the economist, Garber (1989) collected data, around 161 bulbs of 39 varieties were sold during the mania. During that period, the investors are willing to pay any price for that single bulb of a rare broken tulip. Since, the beauty of the tulips flowers are not everlasting, the people during that period used to commissioned artists to capture the beauty of the broken tulip petals in the paintings. Normally the tulips bloom during the spring and the bulbs were harvested during the summer and thus the tulips bulbs were traded during summer only. The demand for the broken tulips were



Fig. 2. “Viceroy” tulip displayed in the 1637 Dutch catalogue *Verzameling van een Meenigte Tulipaenen*. (Source: Wikipedia)



Fig. 3. “Admirael van der Eijck” tulip (Source: Wikipedia)

Table 1. Comparison of goods amount the price of single bulb of Semper Augustus and Viceroy

Goods amount for a single “Semper Augustus” bulb		Goods amount for a single “Viceroy” bulb	
Goods	Guilders	Goods	Guilders
48 tons of rye	558	4 lasts of rye	558
A ship	500	4 fat oxen	480
4 fat oxen	480	2 lasts of wheat	448
44 tons of wheat	448	8 fat pigs	240
8 fat pigs	240	2 tons of butter	192
2 tons of butter	192	12 fat sheep	120
12 fat sheep	120	1,000 pound of cheese	120
1,000 pound of cheese	120	A complete bed	100
A complete bed	100	A pack of clothes	80
A pack of clothes	80	2 hogheads of wine	70
2 hogheads of wine	70	A silver drinking cup	60
A silver drinking cup	60	4 barrels of 8 guilder beer	32
4 barrels of 8 guilder beer	32		
Total	3,000	Total	2,500

much higher than its supply so in order overcome this a contract system was made where the traders signed a contract and the flowers were prepaid for in fall before the bloom could be seen (Moelling, 2016). The flower patterns were unpredictable because not all the flowers yield colourful stripes, it depends on the luck of the buyers and thus it gave rise to gambling where the tulip was like a lottery ticket. Some buyers would sell or took a mortgage to their property or take loan for these unpredictable bulbs. In February, 1637 the tulip bubble burst after the people started to realized the maniac and most of the investors could not afford the price and thus the price for broken tulips went down to a very low that resulted in the crash of the tulip market. As a result most of the buyers went bankrupt.

#### What cause the breaking of tulips?

The reason behind these beautiful and colourful patterns in the tulip petals that caused financial bubble is a virus. The colour breaking of the tulip petals is caused by a plant virus named "Tulip breaking virus" (TBV). It belongs to the family Potyviridae and it infects only the two genera of the Liliaceae family i.e. Liliium and Tulipa.

The virus normally infects the bulb and thus spreads through the vegetative propagation. The virus spreads through the mechanical transmission such as grafting or by the aphids like *Myzus persicae*,



Fig. 4. TBV infected tulip plant showing the symptoms of flower colour breaking  
(Source: Wikipedia)

*Macrosiphum euphorbiae*, *Aphis fabae* and *Aphis gossypii*.

#### Symptoms on the infected plants

The symptoms of the virus are mostly seen on the petals, where the streaking or stripes of different colours can be observed on the uniform colour petals. In peculiar, TBV infection of tulip leaves a stripe pattern without pathogenic lesions on the host (Ryu, 2017). Flames like feathering effect can be seen on the edge of the petals (Fig. 4). The colour variation is caused by local fading, intensification or accumulation of pigments in the upper epidermal layer after development of the normal flower colour (Engelmann and Hamacher, 2008). The symptoms may vary with the variety and the time of infection (Lesnaw and Ghabrial, 2000). In severe infection mottling of leaves can be observed with reduce in bulb size and production. The plant may lose its vigour and the flower production is reduced.

#### Modern day tulips

In modern day, the plant breeders developed a variety of tulips that are disease free and have the exact same color breaking petals like that of the virus infected tulips. Such tulips were known as "Rembrandt tulip". These varieties can maintain its colour through propagation unlike the TBV infected plant where the flower colour pattern are unpredictable and lose its vigor over a period of time, thus the popular varieties of Tulipmania like Semper Augustus and Viceroy are no longer available in today's world.

#### References

- Dash, M. 1999. *Tulipo Mania*. Crown Publishers, New York.
- Engelmann, J. and J. Hamacher. 2008. *Plant Virus Diseases: Ornamental Plants*. In: *Encyclopedia of Virology*, 3<sup>rd</sup>edn. Academic Press, New York, NY.207-229.
- Garber, P.M. 1989. Tulipmania. *J. Polit. Econ.* 97(3): 535-560.
- Lesnaw, J. A. and Ghabrial, S. A. 2000. Tulip breaking: Past, present, and future. *Plant Dis.* 84(10): 1052-1060.
- Moelling, K. 2016. Tulipomania- The first financial crisis by viruses. *Rev. Roum. Chim.* 61(8-9): 637-645.
- Ryu, W.S. 2017. Discovery and Classification. In: *Molecular Virology of Human Pathogenic Viruses*. 3-20.