Changing Consumer Attitude Towards Organic Products and The Mediating Role of Biopesticides

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Abstract-

The demand for organic food products in the market is the highest in the present times. The increasing health consciousness among consumers are making the demand for organic food items surge high. This paper thus is an attempt to analyse through systematic review the various factors impacting the changing attitude of consumers towards organic products along with determining the role of biopesticides. A total of 52 papers have been systematically selected for the purpose of the review from eminent databases. The results indicate the factors of health benefits, quality, price, environmental concerns, subjective norms and food safety concerns as the most influential. The role of biopesticides in the entire growing popularity of organic food products cannot be ignored. It plays an effective mediating role and has a huge potential in the future in case of growing market demands.

Keywords-Organic; Consumers: Biopesticides; Attitude; Health

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1. Introduction

In the present times, consumers are found to be conscious about their lifestyle and food choices more than ever. There are several factors contributing to this increased awareness towards health such as social media platforms constantly bringing in related content. (Yu et al., 2021) mentioned one very important aspect which is the emergence of the Covid-19 pandemic and the impact it made on changing consumers perception towards lifestyle choices. There are reasons associated to food safety, issues regarding the environmental well-being and the changing attitude of people towards life with that of the increase in consumption of organic food products. (Yadav & Pathak, 2016)mentioned that the organic food consumption in the initial days were limited to countries like the United States of America and Europe. It is even interesting to note that the organic products produced in a developing country like India were exported to the developed countries for consumption rather than retaining them for local consumption. However, with the increase in health and lifestyle consciousness, organic products are able to gain popularity and market shares in the regions of developing countries as well.

Table 1- List of Definitions

Variable	Definition
Organic farming	Organic farming is a system of producing various products which helps to sustain the health of elements involved in the process such as the

	ecosystems, soil and people (Verhoog et al., 2007)
Organic products	The food products thus resulted from organic production can be termed as organic food products (Krystallis & Chryssohoidis, 2005; Rock et al., 2017)
Bio pesticide	Pesticides that are comprised of substances for pest control with natural ingredients

Source Author's own

The market analysis involving organic products depict the impact made by these products across the globe. With $20177 million of the global organic food market in 2020, it is further expected to grow till $ 22137 million in 2021 (The Business Research Company, 2021). The compound annual growth rate (CAGR) for the market stands at 9.7 %. The market saw a rise in its sales ones it started recovering from the pandemic and the increasing concerns for health only contributed to this growth rate. The market scenario for organic food products in India is worth mentioning as well. With an expected CAGR of 20.5% the market is forecasted to grow from $ 849.5 million in 2020 to $2600millionduring 2021 to 2026 (EMR, 2021)
The emergence of organic products as one of the most sustainable health options is due to the non- involvement of harmful fertilizers and pesticides in their preparation. (Popa et al., 2019) mentioned that the process of organic farming takes place with the help of natural fertilizers like manure from plants and animals. These biopesticides comes as a relief for consumers as earlier the use of several chemical based pesticides and fertilizers have caused risk among human beings as well as the crops to which they have been applied (Keswani et al., 2019) Due to the reasons concentrating to the increased demand for organic products, the market for biopesticides is also seen to increase. The global market for the same is growing at CAGR of 14.7% in 2020 and is expected to reach $ 8500million by 2025(Markets and Markets, 2020) .
The increasing role of biopesticides in the creation of a healthy environment for lifestyle conscious consumers in today's world motivates the study. The study aims to put forward a systematic review investigating the changing attitude of consumers towards organic products. However, the thought gives rise to one research question-

Table 2- List of Research Questions

RQ1	What are the potential factors that contribute towards the change in consumer attitude from conventional products to organic products?
RQ2	How does biopesticides mediate the situation of changing consumer attitude towards organic products?

Source Author's own

In order to address the above research, question a detailed review of past literature is done to arrive at a concluding remark on the situation. There are several factors that occur when talking about factors contributing towards changing perspectives of consumers for organic products.
Health consciousness is found to be one of the most important factors contributing to changing consumer attitude towards organic products. (Mohamed et al., 2012) found a link between consumer attitude for organic product based on health benefits and their association with willingness to pay a higher price. (Basha et al., 2015) highlighted the importance of environmental concernand the quality of product as a determinant for changing consumer attitude towards organic products. Hence, based on the above observations the hypotheses for the study are as follows-

Table 3- List of Hypotheses

H_{01}	The changing consumer attitude towards organic food is dependent on health benefits derived.
H_{02}	The consumers are willing to pay a premium price for organic products
H_{03}	Environmental concern contributes as a factor on changing consumer attitude towards organic products
H_{04}	The quality of organic products has changed the consumers attitude towards it.

Source Author's own

The study proceeds with the aim to cover the above research questions and validate the hypotheses formulated along with identifying other crucial factors through the review.

Organic agriculture as a system of producing various products which helps to sustain the health of elements involved in the process such as the ecosystems, soil and people(Mohamed et al., 2012; Verhoog et al., 2007). This mode of agriculture focuses on saving the ecological surrounding with the particulars used in the process rather than using inputs that adversely affect the entire system. It involves refraining from the use of artificial fertilizers and chemicals which risks the environmental sustainability to a large extant. The food products thus resulted from organic production can be termed as organic food products(Krystallis & Chryssohoidis, 2005; Rock et al., 2017). Increasing concerns for the environment among consumers have helped in making the concept of using organic food products popular all across the globe(Asif et al., 2018; Ghali-Zinoubi & Toukabri, 2019; Ghazali et al., 2017). The interest among consumers to enhance health and environmental shortcomings have amplified the used of organic food products in the market.

The consumers involvement with organic products is aptly defined by (Tarkiainen & Sundqvist, 2009) as a state of mind that generates motivation affecting the focus on consumers' attention as well their comprehension processes along with overt behaviors. Involvement with a product can be stated as an important aspect of consumer behavior as it grows out of their intuitive values and interests. The involvement of consumers with organic products is due to their personal enhancement and thus involve an interesting factor to consider changing consumer attitudes.

One important consideration when talking about organic products is the contribution of biopesticides to its formation. Biopesticides are defined by the U.S. Environmental protection agency as pesticides that are comprised of substances for pest control with natural ingredients. The use of biopesticides has successfully allowed the consumers to eat food free from chemical fertilizers and pesticides and thus ensuring the safety from health hazards. As discussed above in the recent times, especially after the advent of the pandemic the health consciousness among consumers have drastically increased. The demand for organic products has seen a surge and there is potential for further growth reported. In such conditions, this becomes essential to identify the factors that cater to changes occurred in consumer attitudes towards organic food products. Moreover, it is established that biopesticides have helped in the process and determining the significance of the role played by them is worth exploring.

2. Materials and Methods

The approach followed for conducting the study is a systematic review procedure. This involves reviewing various articles by reviewers across time. The method helps in gathering data from various reviewers through a number of concepts in the literature.Here, the pool of literature majorly focused involves the changing attitude of consumers towards organic food products. In order to validate the factors impacting the above concern, the process of the review is perfectly suitable. With the increase in health consciousness and lifestyle preferences among consumers, measuring the factors

influencing change of attitude towards them is an essential aspect to dwell. In such a situation identifying the factors causing the change in attitude and exploring the presence of a mediating role of biopesticide would be an interesting insight through this systematic review.

2.1 Sources

The process of the review included conducting an extensive literature review. The search for relevant past researches is done in databases such as SCOPUS and Web Sciencethat includes articles from Science direct. The web of science database is covered under the umbrella of SCOPUS and hence technically it is the SCOPUS database that includes the search process. Relevant literature is identified in these databases using keywords such as "Organic", "Biopesticides", "Consumer", "Attitude", "Behavior" etc. The process followed for arriving at the considered research papers are mentioned in the following section.

The following keywords and combinations were used for the search:

Search String Set 1 — ("Organic Farming") AND ("Biopesticide")

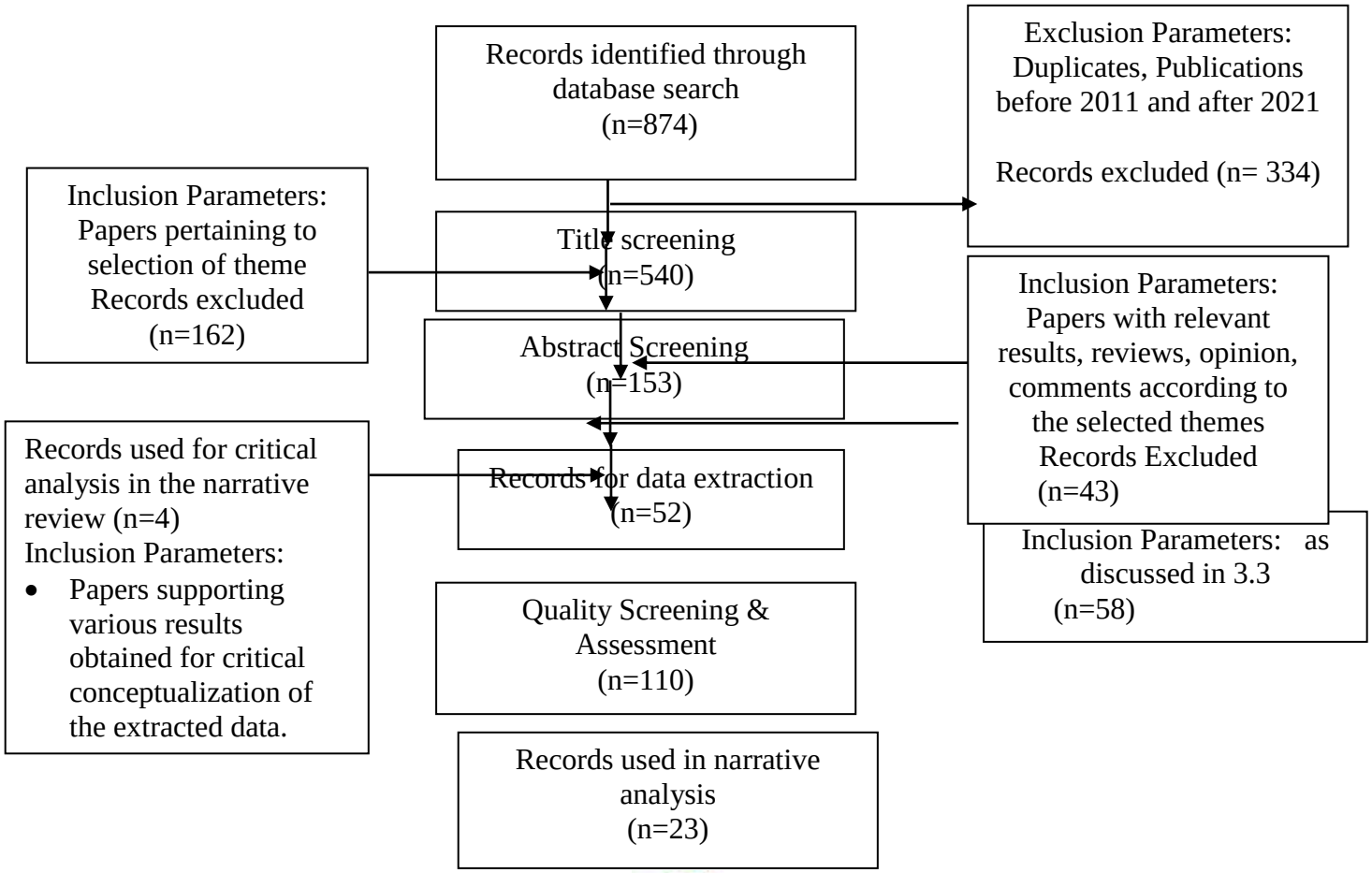
Search String Set 2 — ("Biopesticide") AND ("Organic Farming") AND ("Consumer Perception")

Search String Set 3 — ("Biopesticide" OR "Organic Farming") AND ("Consumer Perception")

2.2 Data Extraction and Synthesis

A strict procedure for analyzing the research papers in hand has been considered. In the first stage the papers are screened based on the title of the papers. The shortlisted papers are than scrutinized thoroughly to understand the factors considered for detecting the change in consumer behavior and are noted down. The research article is then read to understand if the underlying role of biopesticides is mentioned with respect to the process. Once the role of biopesticides is found those papers are marked as "√" in the record or else "×" is marked. A flow chart depicting the entire process is mentioned in the PRISMA created below.

Figure 1 – PRISMA



A total of 540 papers have been shortlisted based on the title screening. However, after removing the papers not corresponding to the topic in hand, a total of 52 papers have been fully reviewed to arrive at the factors influencing the change in consumer behavior towards organic food. The details of these 52 papers are mentioned in Table 1 below. Based on the data collected from the above process, a conceptual model would be put forward to point out the factors specifically contributing towards the same.

Table 4- Selected database and retrieved papers type

Database	Filter	No. of retrieved studies
Scopus	Only conference paper	0
	Only research articles	52

Source Author's own

2.3 Quality Parameters Used for selection

For the quality assessment of the articles selected for the study, three major criteria by(Dybå & Dingsøyr, 2008) have been followed namely – rigorousness, credibility and relevance. This process enables the assurance of including only the high-quality papers for review. The checklist questions for each of the articles have been assigned a maximum score of 8; however, articles with a score of more than 4 can be a part of the study. The selected criteria on being achieved is assigned a score of 1 or else it is marked zero. The detailed process for the selection is attached in the appendix of the study. have been strictly followed when selecting the articles for the review.

Based on the first level of screening conducted through the title of the research article, a total of 153 papers have been shortlisted. Once the irrelevant paper from them, a total of 52 papers have been carried forward to be studied in detail to find out the factors. The findings from these 52 papers have been mentioned in detail in Table 1in the following section.

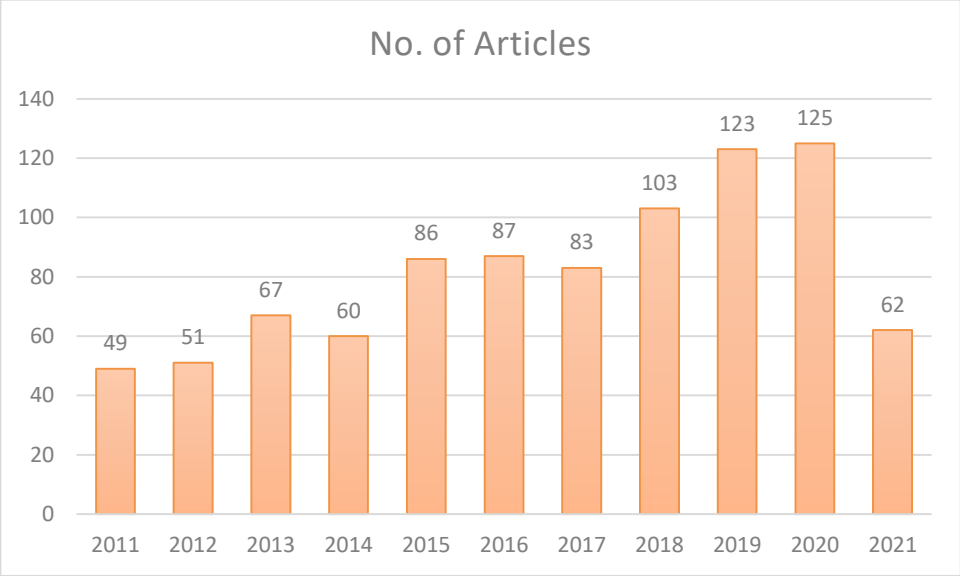
2.4Threats to validity of research and mitigations

The process of conducting a systematic review often generates the concern for construct validity and external validity. In order to overcome these problems, firstly the above-mentioned selection parameter is employed with utmost sincerity. As a follow up the use of PRISMA confirms the mitigation of validity threats arising due to systematic review paper selection.

3. Results

A bibliometric analysis on the topic in hand has been conducted to determine the popularity of the topic among researchers in the past. The analysis is conducted in the SCOPUS database and the per year frequency of articles on the topic is given below:

Figure 2- Bibliometric Analysis



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It is quite evident from the chart that the number of articles in organic food and the behaviour of consumers towards it is increasing. This indicates the relevance of the topic experiencing better prospects in the coming time. Also, the result emerging from the examination of all the studies selected using the PRISMA analysis shows that various factors have been undertaken in the papers for understanding the factors influencing consumer behaviour towards organic products. Therefore, the review contributes to identify the pattern in the existing secondary data and develop future research direction.

Table 1 below represents the details of the topic. Here, it is noteworthy is that all the papers considered for the study are research articles from the Scopus database and are based on primary data collection methods having empirical base for the study.

Table 5: Extraction of secondary data from the selected literature

Sl. No.	Author/s	Objective	Factors Influencing Consumer Behavior	Mediating Role of Biopesticides
1	(Nandwani et al., 2021)	To explore the attitude of farmers in Nepal dealing in fruits and vegetables towards the concept of organic farming	Demographic Features Market for Organic Produce View of Growers for Organic Farming Attitude for Organic Products	√
2	(Taghikhah et al., 2021)	To understand the shift in consumer behavior towards the organic mode of products	Emotions Habits Intentions Price Trust	√
3	(Nagaraj, 2021)	To determine the effect of health consciousness and their attitude on the purchase of organic food	Health Consciousness Food Safety Concerns Consumer Attitude	√
4	(Liu et al., 2021)	The study analyses the factors that affect the selection of organic food in China among the consumers	Health Consciousness Environmental Consciousness Organic Purchases Attitude	√
5	(de Canio & Martinelli, 2021)	The study is conducted to determine the intention of consumers to buy organic food	Price Quality Labels Packaging Health	√
6	(Mkhize & Ellis, 2020)	To determine the barriers, exist in the purchase of organic products in a developing nation	Organic product buying behaviour Reasons for non-purchase of organic products Attitudes Social norms	√

			Perceived behavioural control	
7	(Yanakittkul & Aungvaravong, 2020)	To explore the farmers intention in Thailand towards the concept of organic farming	Attitudes towards farming behaviour Group–norm influences on farming behaviour Perceived Behavioural Control of Farmer Comparative Usefulness of Behaviour Perception of Risk of Farming Support of Government Policy Intention toward Organic Farming	√
8	(Feil et al., 2020)	To measure the behavior of consumers towards consumption of organic products in the region of Southern Brazil	Reasons for buying Values Consequences Image Characteristics Selection criteria Type of food Frequency	√
9	(Aitken et al., 2020)	To explore the role of labelling on consumers intention to purchase organic food	Attitude Subjective Norms Perceived Behavioural Control Intention Desire for more actionable labelling Satisfaction Increased behavioural control	√

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10	(Molinillo et al., 2020)	The study lays its focus on determining the factors influencing the purchase of organic food items amongst the millennials in Brazil and Spain	Food safety concern Natural content Environmental concern Sensorial appeal Health Consciousness Social Consciousness Willingness to Pay Purchase Frequency	√
11	(Petrescu-Mag et al., 2019)	To determine the perceptions and willingness to pay for biopesticides among Romanian Farmers	Perceived Effect of conventional pesticides on pests Perceived Effect of conventional pesticides on farmer's health Perceived Effect of conventional pesticides on the environment Willingness to replace conventional pesticides with bio-pesticides at the same price Willingness to pay a higher price for bio-pesticide	√
12	(Konuk, 2019)	To understand consumers perception towards restaurants serving organic food	Perceived Food Quality Price Fairness Perceived Value Satisfaction Word-of-Mouth	×
13	(Kushwah et al., 2019)	To understand the ethical considerations taken by consumers when buying organic food	Functional value Social value Emotional value Conditional value Epistemic value	×

14	(Basha & Lal, 2019)	The study determined about the attitude of consumers towards purchase of organic products in India	Health and Lifestyle Support Local Farmers Product Quality Convenience and Price Animal Welfare Safety and Trust Subjective Norms Attitude	√
15	(Carfora et al., 2019)	To understand consumer behavior towards the purchase of organic milk	Attitude Subjective Norm Past Behavior Trust Self-Identity	×
16	(Janssen, 2018)	To determine the factors responsible for the purchase of organic products in households	Healthiness and naturalness Environmental protection Local/domestic origin Price consciousness Convenience orientation	√
17	(Konuk, 2018)	To find out the factors contributing towards consumers' intention to purchase organic food with private label	Store Image Perceived Quality Trust Perceived Value	×
18	(Schäufele & Hamm, 2018)	The authors enquired about the perception of organic wine purchase in Germany	Preference for organic products Responsibility for the environment and society Appreciation of local and domestic products	×
19	(Prakash et al., 2018)	To determine consumers intention for purchasing products in organic food items through application of	Perfectionism, high-quality consciousness Brand consciousness Novelty consciousness	√

		consumer style inventory	Recreational, hedonistic shopping consciousness Price consciousness Impulsiveness Confusion by over choice Habitual/brand loyal	
20	(Asif et al., 2018)	The study focuses on determining the factors influencing the purchase of organic food	Attitude Subjective Norms Perceived Behavioural Control Health Consciousness Environment Concerns Awareness	√
21	(Oroian et al., 2017)	To measure the attitude of consumers towards the organic products and its impact on sustainable development in Romania	Natural and Sustainable Consumption Extrinsic Attributes Health Sensory Appeal Weight Concern Social Statute	√
22	(Singh & Verma, 2017)	To determine the factors that influence consumers buying of organic food products	Health Consciousness Knowledge of organic food Subjective Norm Perceived Price Availability	√
23	(Rana & Paul, 2017)	To determine consumer behavior towards the purchase of organic food	Health consciousness and expectations of well-being Quality and safety Environment Friendly Willingness to Pay Certification	√

			Fashion Trend &Unique Life Style Social Consciousness	
24	(Sivakami, 2017)	To explore the various aspects related to the purchase intention of consumers towards organic products	Demographics Reasons for purchasing organic food Price	√
25	(Ghazali et al., 2017)	To conduct the study focusing on investing consumer values related to the purchase of organic personal care products	Consumers' perceived value Safety value Health value Social value Hedonic value Environmental value Product knowledge Subjective norms Perceived behavioural control	√
26	(Kumar & Chaurasia, 2016)	To study about the attitude of young individuals in India about organic food	Health Consciousness Environment Healthy Lifestyle	√
27	(Loebnitz & Aschemann-Witzel, 2016)	To study about the perception of consumers towards organic products	Product Expectations Pro-environmental Values	×
28	(Hung et al., 2016)	To measure consumers attitude towards the concept of buying processed meat containing natural components	Preference for natural over chemical additives in food Awareness Socio-demographic characteristics Body Mass Index (BMI) Perceived financial situation	√
29	(Annunziata & Vecchio, 2016)	To learn about the preferences of consumers for food	Environmental protection Health	

		choices in the southern region of Italy	Better taste Rigorous safety control Biodiversity preservation Distrust in conventional Modern and trendy To support rural farmers Fresher products Curiosity Respect for animal welfare Prices too high Insufficient information No trust in certification body Little difference with conventional	√
30	(Ueasangkomsate & Santiteerakul, 2016)	To understand the attitude of consumers' for buying organic foods for the purpose of encouraging sustainability	Food safety Health Environment Animal Welfare Local Origin	√
31	(Basha et al., 2015)	To determine consumers' attitude towards organic food	Environmental Concern Health Concern and Lifestyle Product Quality Subjective Norms	√
32	(Lee & Yun, 2015)	To determine the factors that indeed influence the purchase intentions for organic food	Nutritional content Natural content Ecological welfare Sensory appeal	√

			Price Utilitarian attitudes Hedonic attitudes	
33	(Bozga, 2015)	The study explores the consumers of Romania and their perception about the prices of organic products	Price	×
34	(Yazdanpanah & Forouzani, 2015)	The study determines the purchase behavior of organic foods among Iranian students	Self-Identity Moral Norm Attitude Subjective Norm	√
35	(Barbieri et al., 2015)	The study involves a case of consumers sensorial reaction to organic products	Hedonic Sensory Analysis Phenolic Compounds Volatile Profile	×
36	(Mohamad et al., 2014)	To address the results of consumption of organic food among consumers in the urban areas	Price Product Information Environment Protection Health	×
37	(Basha, 2014)	To find out the factors that influence the purchase intention of organic food	Environment Health Quality Nutrition Availability Safety	√
38	(Marian et al., 2014)	To specifically determine the role	Price	

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		of price in the context of organic food products		×
39	(Janssen & Hamm, 2014)	To learn about the attitude of consumers towards organic food in Germany	Demographics Consumer Segments Consumer Attitude	×
40	(Haugaard et al., 2014)	The attitude of consumers towards the preservation organic meat using herbs is enquired about in the study	Taste Appearance Shelf life Texture and odour Price Information	√
41	(Schleenbecker & Hamm, 2013)	To explore the perception of consumers towards the characteristics of organic products	Product Labelling Product Range Product Support Services Product Design	√
42	(Mauracher et al., 2013)	To understand the preferences of consumers when introducing new organic products in Italy	Demographics Household Size Province of Residence	√
43	(van Loo et al., 2013)	The study focused specifically on studying consumer behavior with respect to organic yogurt	Awareness and Knowledge Purchase Frequency Importance of Yogurt Beliefs	√
44	(Laureati et al., 2013)	To understand the expectations kept by consumers for organic production of yogurt	Recycling Respect of the environment Enhancing renewable/alternative energies Enhancement of local production	√

			Preserving natural resources Supporting local economy Enhancement of free-preservatives food products Enhancing sustainable production labels Enhancement of non-industrial farming Enhancement of organic cultivation Promoting environmental sustainable production Contrasting the new developing countries exploitation Promoting workers' rights	
45	(Falguera et al., 2012)	To find out the current trends involving organic products in food consumption	Consumers' Mistrust Health, Social and Environmental Benefits Functional Foods Implications for Rural Environment Public and Private Regulatory Standards	√
46	(Shafie & Rennie, 2012)	To understand consumers' perception about organic food	Demographics Premium Price Quality	√
47	(Zagata, 2012)	To understand consumers' behavioral intention and the belief that they hold for organic food	Attitude Subjective norm Perceived behavioural control Intention	×

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48	(Janssen & Hamm, 2012)	The study focuses on studying about the consumer preferences in labelling of organic products in the market	Awareness Trust Credibility Organic standards Control system	√
49	(H. Stolz et al., 2011)	To determine the difference between organic and conventional food among consumers to measure their attitudes	Concerns about food ingredients Willingness to pay higher prices for food quality and organic food Health concerns in relation to food production Low involvement with food quality and nutrition Preference for food from Switzerland/Germany	√
50	(Hanna Stolz et al., 2011)	To determine consumers' preferences and the determinants for organic products	From pasture-raised cows Free from artificial additives and flavours Reduced use of pesticides No use of genetically modified organisms No preventive use of antibiotics Organic production Higher price for higher quality Domestic production	√
51	(Ruiz de Maya et al., 2011)	To find out the pattern followed in the consumption of organic food in Europe	Attitude Subjective Norms Perceived Control Values	√
52	(Jensen et al., 2011)	To determine the demand among	Stable Expansion	

		consumers about organic food in the markets in Europe	Policy Driven Growth Techno sustainability Agricultural Industrialization	√

Source Author's own

4. Discussion

The papers extracted for the purpose of conducting the systematic review revealed several important insights into the changing attitude of consumers towards organic food and the point made by the use of biopesticides in the entire situation. In Section 1 there are four hypotheses that have been laid for the purpose of the study. The factors found to be evidently impacting the changing behavior of consumers towards organic food are initially considered for the review. These factors comprise of health benefits, environmental concerns, price and quality. However, with respect to the study conducted, few other factors are seen to dominate the changing consumer behavior as well. The hypotheses, the mediating role of biopesticides and the other relevant factors discovered are mentioned in the following sections.

4.1 Factors Influencing Consumers Attitude Towards Organic Food Products

The review conducted on the basis of 52 papers in the field of changing consumer behavior towards organic food which are thoroughly been analyzed to clearly state out the factors involved. The changing consumer behavior about organic food is seen to be highly influenced by the health benefits provided from the use of such products(Liu et al., 2021; Nagaraj, 2021). The consumers in the recent years have started gaining wider perspective towards maintaining a good and healthy lifestyle(Basha et al., 2015). This has encouraged consumers to opt for food that includes organic materials and do not involve higher levels of chemicals in them(Falguera et al., 2012; Singh & Verma, 2017). Another factor that is closely associated with the changing attitude for organic products based on the health concerns is the quality of these organic products. As the production of food items based on organic and natural means involves the assurance of a high quality of various minerals in it, consumers are drawn towards the endless possibilities for health improvement that can be achieved from organic food products(Basha et al., 2015; de Canio & Martinelli, 2021). The quality of food being consumed on a daily basis is enhanced and it implies the consumers successful step towards a healthy lifestyle (Rana & Paul, 2017).

Moving on to the next factor in the hypotheses -price. It is often observed that a premium price is associated with the organic products and the willingness to pay is an important factor that motivates a consumer to eventually procure a product or not. In case of organic products, it is observed that consumers are indeed changing their attitude towards the premium level of pricing associated with it(Haugaard et al., 2014; Marian et al., 2014; Sivakami, 2017). Consumers believe that for the benefits derived from consumption of organic products, it is valid to pay a premium price for them. The willingness to pay for organic food products is seen to be high in consumers (Shafie & Rennie, 2012). (Rehman, 2021)the last factor attempted to be validated through the study includes environmental concerns when changing attitudes towards organic products. As organic products are closer to nature and the process implemented for their production includes a more sustainable method, the environmental concerns being reached through it quite wide (Janssen, 2018; Kumar & Chaurasia, 2016; Molinillo et al., 2020) .

Thus, all the alternate hypotheses formulated can be successfully accepted for the review and the four factors can be considered as some of the most influential factors in

determining the changing attitude of consumers towards organic food products.
Apart from the factors considered for the formulated hypotheses, there are other important factors that are found in the due course of the study. The factors which are seen to appear in a number of studies on the topic and are pointed as important in this aspect are discussed in this section.

The first such factor observed is the food safety concern. The safety of food especially in this day and age is a high concern for consumers(Basha & Lal, 2019; Ghazali et al., 2017; Molinillo et al., 2020). With the use of different chemicals and preservatives in the manufacture of different food items is seen to arise. It is found in several studies that safety concerns form as one of the key drivers in determining the purchase intention of organic foods based on the positive impact, they have on consumers(Michaelidou & Hassan, 2008; PINO et al., 2012). Moreover, there are also evidence suggesting that consumers having high safety concerns prefer to buy organic products from locals which in turn helps the community to grow as well(Winter, 2003). Thus, food safety concern has been observed as an important factor with respect to changing consumer attitude towards organic food.

The second factor highlighted from the study conducted in changing consumer attitude towards organic products is subjective norms of consumers (Basha & Lal, 2019; Ruiz de Maya et al., 2011; Yazdanpanah & Forouzani, 2015; Zagata, 2012). The perceptions formulated towards a particular concept especially in a highly interactive environment yields high potential to shape a consumer's decision. Subjective norm is one such factor where the reference group being followed by an individual can highly impact their behavior(Basha et al., 2015). Subjective norm has been addressed as an important factor in the case of consuming organic products in the past(Thøgersen et al., 2016). The capabilities of this factor are immense in changing consumer attitude towards organic food products.

4.2 Mediating Role of Biopesticides

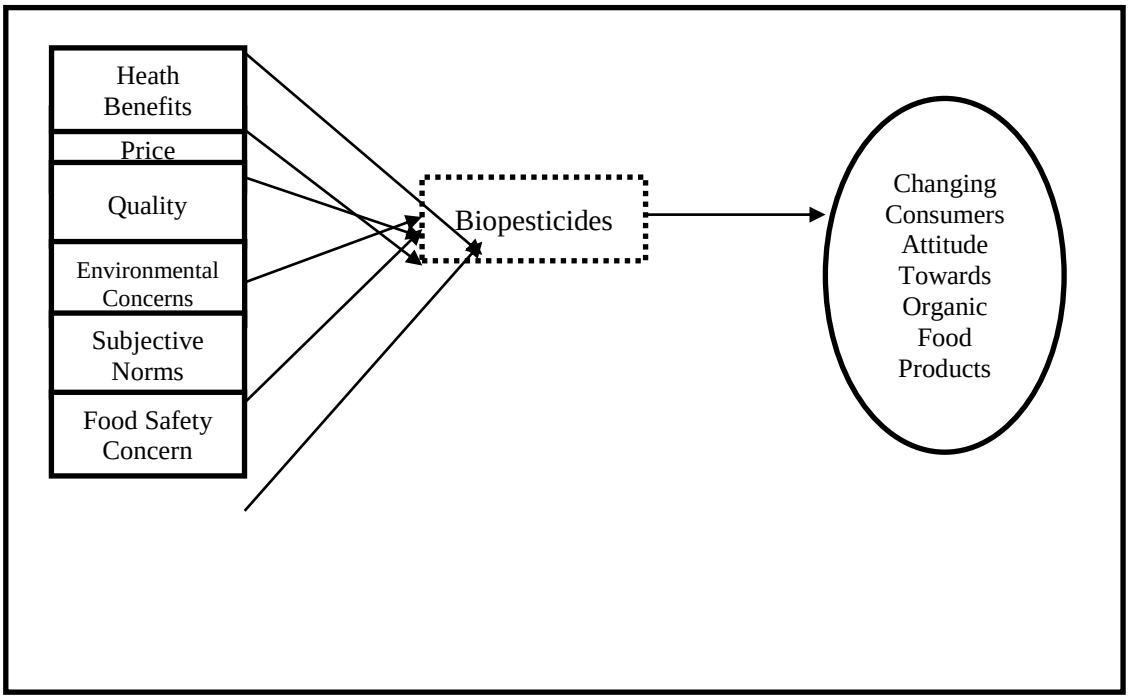
One of the most important reasons that change consumer attitude towards organic products is its natural methods of growing and preserving food items. The chemical fertilizers and pesticides used for growing and producing food items have raised a concern amongst the consumers and; thus, the reliable nature of biopesticides in organic food products enables consumers to shift from normal food products to those of organic products (Annunziata & Vecchio, 2016; Hung et al., 2016; Lee & Yun, 2015; Petrescu-Mag et al., 2019). Out of the 52 papers analyzed in the study, 40 of them clearly mentions the role of biopesticides in increasing the popularity of organic products amongst consumers. Therefore, it is quite evident from the systematic review conducted that biopesticides do play a mediating role in changing consumer attitude towards organic food products.

4.3 Implication of study

The study successfully generates a framework from the systematic review conducted and presents a list of factors that have been identified as significant in determining the changing attitude of consumers towards the organic food products.

A pictorial representation of the findings from the research is generated through a conceptual framework and is given below.

Figure 3- Conceptual Framework



Source Author's own

The most organic factors weaved out of the analysis includes the health benefits, the quality of products, the price associated and the environmental benefits. These factors as a whole state the idea that organic food items are a source of sustainable consumption where the materials involved are obtained from its natural resources. The quality is therefore better and the health benefits induced are higher. The consumers are seen to be willing to pay a premium price in exchange of these organic products. Moreover, two other factors found to be highly influential in changing consumer behavior towards organic food items are the food safety concerns and subjective norms. The influence of the social group in changing the attitude towards consumer behavior is seen to be quite evident in this aspect.

As the attitude of consumers are seen to change towards organic food items, it is worth noting that the most important feature associated with it is the natural means of its production. The biopesticides have a crucial role to play in this aspect. It is due to the implementation of various biopesticides in producing the organic products that generates a sense of health benefits and food safety concerns among the consumers. As the organic food market is growing day by day, it is the biopesticides market too which is seen to have an increasing demand in the market. The requirement of biopesticides for the production of organic products is to further see a rise and it provides a great opportunity for local communities dealing with the production of biopesticides such as cow manure and other home-grown plants. The role of biopesticides cannot be avoided when talking about the upcoming growing market of organic food products and thus there lies a good scope of growth of the biopesticides market as well. The use of biopesticides provide an upper hand in the world food program forum. The platform being supported by United Nations provides help in overcoming the food security and hunger issues. The use of biopeptides as is evident from the review above offers a health option

to its consumers and help them maintain their lifestyle choices. The changing attitude of consumers towards organic food products and the emerging urge of consumers to use such food would help in developing a healthy eating habit across the entire globe.

4.4 Limitations of study

The study in hand although successfully addresses the research questions in hand has certain limitations in its process. Firstly, the study is based on previous literature in the topic and do not include any empirical evidence of its own. Secondly, due to the strict quality evaluation criteria few relevant papers in the topic could not be included in the evaluation process.

5. Future research agenda

The study put forward a number of striking revelations in the changing consumer attitude for the organic products and the role of biopesticides in it. The positive attitude of consumers towards the use of organic food products in the recent times have opened up a high level of business potential not only for the organic farmers but also for the biopesticides market as well. The buyers too have a high profit engrossing potential in the future through organic farming and contract farming in such cases could prove beneficial for both the parties. The contract agreement amongst the farmers and buyers of organic food products has an upcoming scope in the market and research focusing on the same must facilitate this venture. The market of biopesticide is as mentioned in an increasing mode, in such cases export of organic products like fruits can boost the market further. There are several exotic fruits available in a particular geographic location and exporting of them can further grow the numbers for the biopesticide market. The export market in terms of organic products in a developing country like India would be an interesting future research agenda. This would help in gaining an understanding in the present market scenario and help marketers to strategies to increase the sale of organic products and uplift the biopesticide market in the country.

6. Conclusion

The inclination of consumers towards organic food products is increasing day by day. This is mostly due to the consciousness of consumers towards leading a healthy lifestyle. The present condition of Covid-19 has somehow increased the consciousness of consumers related to their food habits and lifestyle choices. The study clearly reveals the different aspects of consumer attitude towards organic food products and how the role of biopesticide in the same cannot be ignored. Moreover, the research provides implications from the study along with various further research agendas that can be undertaken to increase the organic food product revolution all across the globe.

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