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Aavin Dairy Boosts its Marketing Efficiency by Modernisation Plan

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ABSTRACT

Customer satisfaction is one of the most important tasks facing businesses today. Unless organizations can retain the loyalty of their customers, they will not be able to retain their business and in the long run future will be uncertain. Achieving the highest level of customer satisfaction should increase the marketing performance of any product. This study conducted with specific objectives and analysed various problems which stand in the way of the growth of marketing and development of this milk producing union. The aim of the present work is foundout the merits and demerits of the Aavin milk diaries and provide suggestions for theimprovement of the Trichirappalli District Co-Operative Milk Producers" Union Limited, Trichy.

Keywords: Aavin Milk, Milk Diaries, Customer satisfaction, Co-Operative, Milk Producers and milk marketing.

Introduction

Dairying has been a secondary occupation to a significant segment of the population in India. Still, it is not being given due attention. It is observed that in the Five Year Plans, the fund allocations are lowered in the Ixth Plan with 42 percent than the Xth Plan which is given 56 percent out of the total allocations to Animal Husbandry and Dairying.

In the modern days, milk income occupies a significant role to the farmers of India.Cooperatives occupy a vital place in the procurement and sales of milk marketing. It plays a very important role in almost all rural and most of urban areas by providing quality of milk at reasonable price. In India, milk is mostly produced in rural areas while the profitable market is the city, hence, it is largely found in urban areas. Thus, milk societies have come to be organized for supply of milk to urban consumers.

As on today, the dairy industry occupies a very significant place in the agricultural panorama of India. India has the highest number of milch animals in the world and it is placed in the first position with regard to milk production. The reason for the low milk yield can be attributed to non-descript type of milch cattle. It is observed that 56 percent of the feed intake is used by the cattle for body maintenance and only 44 percent is converted into milk.

All the consumers‟ survey uses liquid milk every day. A major percentage of people purchase Aavin milk for requirements. Most of the people purchase 500 ml and 1 litre milk a day. There is more demand for milk during morning time. Almost all people prefer pasteurized milk for their requirements. There was a

considerable communication gap between Aavin and the consumers so that almost all of them do not know the difference between different types of Aavin milk and by products.

"We know what our customers want." That is perhaps the most dangerous phrase ever uttered by a business manager. Because unless you ask, you really don‟t know what consumers think, believe, or want. Consumer opinion surveys are invaluable to guiding business success because they help you overcome your own biases about the marketplace. Whether you are introducing a new product or service, or launching a new marketing campaign, taking consumer opinions for granted can lead you astray. Consumer opinion surveys are designed according to the latest best practices of survey research and lead to improved business decision-making and greater success.

Does your business need information to help make a decision? Whether it‟s determining which concept will work best in the market, determining how consumers perceive your brand, or estimating the size of the market for a new product, market research surveys are the answer. The consumer opinion survey process begins with the questionnaire includes questionnaire design consultation services in all client projects, and reviews. All consumer opinion survey instruments to assure validity, reliability, and bias reduction. Based on the analysis the Aavin milk diaries find the short fall and making new products should help to improve their marketing performanceof Trichirappalli District Co-Operative Milk Producers‟ Union Ltd. Trichy.

Result and Discussion

Major findings of the study reveal the following:

Tamilnadu occupies the eighth place in milk production constituting only 5.6 percent. On the other hand, the average milk yield is miserably low with 1.6 litres per day in spite of its abundant wealth in green grass, feed and fodder.

Dairying has been a secondary occupation to a significant segment of the population in India. Still, it is not being given due attention. It is observed that during 1991-1992, 2000-2001,2008-09 and 2016-17 periods 55.7 MT, 78.3 MT, 114.4 MT and 118.2 MT milk was procured respectively from various Indian diaries.

The average milk yield of buffalo and cross breed is one and half times than cow milk yield. It is also revealed in the study that crossbreed cows have a higher average yield of 2.86 litres than upgraded buffaloes with 2.66 litres.

It is found that in Aavin cooperative dairy, the sale quantity of milk is more than its procurement quantity. The reason is that milk powder is added and standardized to meet the increase in demand especially during summer.

Reprocessing and recombination increases the cost which has to be paid by the consumer. Therefore, an important aspect of policy in future planning for marketing of urban liquid milk is that reprocessing is to

is to be avoided, wherever possible. Innovations in dairy technology, for the preparation of newer products will make the milk more effective in its utilization.

Aavin Cooperative Dairy has adopted „Administered Pricing" method in which the price of milk to the producer as well as to the consumer are fixed by the Federation and the dairy has simply to implement it. This system creates a gap between procurement and marketing.

The dairy is moving with gain because the total cost per litre is worked out at Rs. 36 per litre whereas the selling price is Rs. 42 per litre with a gain of Rs. 4 per litre. The processing and selling and distribution charges are Rs. 0.62 each per litre.

The study brings out the observation that Aavin is following a concrete promotion policy for its by-products. However, they do not concentrate on all the by-products, this has led to the drop out of some by-products and the declining trend in the sales of some other products.

In the case of milk producers, although the share of landless and marginal farmers together account for 35 percent of the total milk, yet landless labourers contribute very low towards marketed surplus due to low milk production and consumption for their own requirements.

The performance of unregistered milk producers" cooperative societies is most discouraging. It reveals from the study that most of the societies have less than 100 active members and contribute an insignificant quantity of milk. This clearly establishes that these societies have no encouragement whatsoever either from Government or Cooperative Banks.

Door delivery is preferred by the households in the upper income group. This could be due to the fact that the higher income households might be willing as well as able to pay extra charges for door delivery.

Post payment is the most widely prevalent mode of payment for milk; advance and coupon system is rarely followed in these districts.

Higher monthly household income categories have tendencies to pay at the end of month and lower monthly income categories have more tendencies for daily cash payment. This could be a reflection of the supplier"s unwillingness to allow credit for lower income customers.

Milk is bought in the morning in around three-fourths or most of the cases. Extent of evening purchase in addition to the morning purchase is higher among the higher consumption segment.

Most of the consumers complain about leakage of packet milk, taste, smell, quickly spoiled,and powder mixed contents of Aavin milk. The consumers have a complaint that even though pasteurization is a hygienic practice, it makes the milk taste different from that of fresh cow"s milk.

About 36 percent of the milk booths have less than 100 consumer households. It is clear from this data that the agents have very poor income and the booths are not viable in the marketing aspect. It is observed that the infrastructural expenditure engulfs the income and the survival of the booths is at stake.

In Aavin Cooperative Dairy area, 40 percent of the households prefer to buy milk from the private agents, whereas only 30 percent are inclined to purchase Aavin milk. This established that majority of the

households have clear aptitude towards private vendor‟s milk.

With regard to the quality of Aavin milk, 40 percent households opine it as low milk and about 60 percent feel it to be medium. This shows the trend of consumers on the quality of Aavin milk which results in increasing trend of sales.

Most of the consumers feel the price of Aavin milk is high in comparison with the private agents‟ milk. This establishes the fact that consumers are more conscious of price in relation to quality. There is a complaint from non-consumers of Aavin milk that the increase in price of Aavin milk has resulted in a corresponding increase in price of milk supplied by the cycle agents.

But even then many consumers are ready to pay a little more for improved quality of milk.

30 percent of the bulk consumers buy less than 25 litres of milk and 25 percent buy more than 50 liters of milk per day. Milk is mostly utilised for making tea/coffee by the bulk consumers. 60 percent of the respondents use more than 70 percent of the milk for making tea/coffee. Among other products, curd is the most commonly made.

Next to milk, Aavin products ghee, butter, khova and FM, having maximum sales in restaurants and bakeries.

Aavin products have retail outlets in Restaurants, Bakeries and General stores other than Aavin outlets. A certain percentage of the retailers are not satisfied with the distribution system of Aavin. Majority of the retailers could meet the demand of milk but there were shortages in rare cases.

Majority of the retailers are not satisfied with the commission (50 paise per packet) given by Aavin, because when compared to the competitors coming to the market, the commission is very less.

Sales of Aavin products give the predominant source of income for majority of the agents.

But major percentage of Aavin agents caters to less than 100 customers per day. Competition from other outlets (due to too many new agencies in a small area) has led to lower sales according to some agents.

More than half of the respondents say that they face competition from the nearest Aavin agents. This is due to the sanctioning of agency without considering the potential of that area.

Among the four groups of retailers, Aavin retail outlets record the maximum sales. The reason is that many of the other shops do not have a proper sign board or logo of Aavin for their shop‟s identification.

Leakage of packs is a major problem, especially because leaking packets are not replaced if not detected in time. However, it is not possible to detect all the leaking packs in a short timewhen Aavin van makes the delivery.

There are complaints about the spoilage of milk. Many of the consumers complain that they are sometimes supplied with old stock of milk. The distribution of old stock may be one of the reasons for spoiled milk.

Suggestions

The success of milk production and marketing can be attributed to the following:

Advertisement increases the marketing performance of any product. Most of the consumers are unaware of nutritional importance, price and other details of the dairy milk. Hence, Aavin should set out advertising net work for different products. It is a fact that Aavin is spending too little on advertisement efforts. Even though Aavin is the market leader for milk and milk products in Trichy, a proper advertisement can effect in an increase of sales to a large extent.

Some products of Aavin for which the market share is low can be improved successfully with the help of better advertisement.

The investigation conducted on consumers reveals that almost all of them are unaware of the difference between the toned and standardized milk of Aavin. Also, many of them have mistaken plain milk in tetra packs for the pasteurized milk in sachets. These are due to lack of proper advertisement of these products.

A major percentage of the populations prefer Aavin milk only because it is easily available.

This makes it clear that most of the consumers do not rate. Aavin milk is qualitatively good. Many of them are ready to pay a little more for better quality. So Aavin should initiate steps toimprove the quality of milk and must eradicate the sour taste and bad odour of the milk.

It is observed that nearly 50 percent of the consumers prefer to purchase private milk only for high fat content. At present, Aavin is marketing toned milk at 3 percent fat which is not liked by the consumers. So the dairy is advised to market the milk in two grades one at 3 percent fat and another grade at 5 percent fat. In addition, double toned milk should be sold at cheaper rates in low income group areas.

The growth of dairying in the state hinges on the effective utilisation of massive investments in the pipelines and the success of Anand Pattern. The ascribed motives, goals and actual performance of Anand Pattern deserve to be watched for prospective assessment and future policy decisions.

In order to remain in constant touch with the changing consumer needs and for receiving consumer feedback, agents should be encouraged to give feedback to Aavin. There should be greater flexibility in accommodating orders till late in the day. An improvement in communications should facilitate this.In order to increase milk marketing, advertisement on TV, Radio, News papers, etc., should be conducted by the Governmental authorities; booklet and notices should be distributed in units.

Market research is to be conducted to find the demand for milk and to explore the marketing potential for milk and milk products.

Effective training should be provided to the agents and sales personnel in order to improve the sales and techniques of marketing. It is also suggested that milk agents should be appointed on salary-cum-commission basis which provides both fair wages and incentives.

The working conditions of the agents are very poor. There is no shelter for several milk booths, no furniture and insanitary conditions prevail around the booths. Hence, by providing minimum facilities,

sales can be improved.

It is the responsibility of the vendor to sell all the milk indented. Unsold milk is not taken back by the dairy. No refrigeration facility is provided by the dairy. Due to these difficulties, indent is placed by the agents for the minimum quantity. All these hardships have reduced the sales to the minimum. Hence, Aavin has to take corrective measures.

To have a more sustained commercial viability of the dairy, it is inevitable to emphasize the aspect of promotion especially in the present environment of market competition. The marketing net work is to be strengthened so as to make it a viable organisation.

Low per capita consumption of both milk and milk products. Low penetration of milk in lower income groups due to high cost of milk. Market for fluid milk is catered by both packaged and loose milk. Very low competitive activity at present, however new players are the under exploited marketing potential of the area.

Increase in volumes of packaged milk sales of Aavin is possible through - increase in per capita consumption of existing Aavin buyers.

Increase in the consumer base itself through (i) conversion of loose milk buyers to Aavin packaged milk, (ii) conversion of buyers of packaged milk brands other than Aavin to Aavin buyers.

The option would be less attractive as per capita consumption of current buyers of Aavin is already high and it would perhaps not be easy to induce them to consume more milk. On the other hand, the base of loose milk consumers is so large that they are likely to yield large volumes even at lower per capita consumption levels. Hence, the conversion of loose milk buyers to Aavin milk is the best attractive option. This should be done, while retaining the existing Aavin milk buyers. Aavin being the dominant player in the market should also aim at increasing the consumption of milk at a generic level, at it is most likely to benefit from such an increase.

A differential pricing policy in the lean and flush seasons could help in reducing the imbalance in consumption to some extent. However, any change in prices should be accompanied by proper consumer education as a decrease in price may be associated with a corresponding decrease in quality. This is a possibility, especially in case of product categories like foods.

Aavin milk and milk products have slightly higher price. People are to be informed that when Aavin increases the price of milk, the local agents also increase the price. Even though it is not possible to equate the price of Aavin milk with that supplied by local agents, since the cost of pasteurizing and packaging is to be considered, a slight reduction in price can increase the sales. Aavin can follow differential pricing during flush and lean seasons.

Aavin should target increasing its milk sales-household consumers, bulk consumers and distribution agents. Home delivery of Aavin milk at nominal extra charges is an ideal to convert the convenience seeking loose milk buyers and also those buying loose milk due to free home delivery. However this

of Aavin milk at nominal extra charges is an ideal to convert the convenience seeking loose milk buyers and also those buying loose milk due to free home delivery. However this needs active participation of the distribution agents.

Introduction of vending machines would be an interesting option. As milk can be provided at a slightly lower cost through vending machines, it may attract the price sensitive consumers. Also milk is made available in the loose form through vending machines, loose milk consumers can be targeted.

These can be ideally be targeted through the bulk loose milk supply. Focused targeting of loose milk buyers needs to be undertaken through direct selling. Special milk can be sold for infants with specific standards to white card holders at concessional rates.

Bulk loose milk supply should be extended to areas not covered at present. Also, since standardized milk is more preferred among bulk consumers, it should be made more easily available in all areas.

In towns, round the clock supply is very much required. Some such booths with preservation facility would improve the sales in a significant way. The cooperation of the distribution agents is integral to the success of any marketing policy initiative. They should be made to feel a part of the marketing team.

The redressal of the agent‟s complaints and their constant education and orientation becomes a must. Increased commissions are also needed to maintain agent motivation as larger commissions are being offered by competitors.

The agents should be assisted in setting up door delivery system for the consumers in their vicinity. They should also be given loans and subsidies for improving their infrastructure and buying cold chain equipment.

Milk powder consumption is substantial where it is used as a substitute for fluid milk. Milk powder production helps Aavin handling the milk supply imbalances between the flush and lean seasons. However, the market for milk powder is also very competitive with the presence of large number of heavily advertised national brands. So also the solubility of the powder is an important aspect which affects the consumer pull. Thus more effort should be made to improve the quality, supported by high level of advertising.

Many consumers complain that Aavin milk, due to pasteurization becomes tasteless. Also,there are complaints about adding milk powder to milk. Hence, Aavin must make aware its consumers the quality, contents and hygienic nature of pasteurization though an educative advertisement. There is much scope for advertisement of Aavin products.

Better process control of packing machines to reduce incidence of leakage and maintenance of cold chain to prevent spoilage are also needed.

There is a widespread complaint about the irregularity in the distribution timings. Some of the retailers selling Aavin products inform that the vehicle does not at all reach their shops.

Aavin should check the routes of distribution vehicle and also must try to rectify the complaints of the

retailers.

Aavin should make a field survey to find whether the retailers are supplying old stock and proper steps should be taken to prevent this. Even though many consumers are satisfied with the service rendered by Aavin retail outlets there are general complaints like retail outlet not within walking distance, not supplied in time, etc.

A solution for these complaints is promotion of house delivery system. House delivery has two advantages: i) it will reduce the complaints, ii) since many people prefer local agents as they deliver milk at home, they will purchase Aavin milk, thereby increasing the sales. However, field survery should be made to find out which area needs a retail outlet and also Aavin must persuade the retailers for house delivery.

The fact that Aavin retail outlets record more sales than any other shops points out that a sign board or logo of Aavin will attract more customers. Many of the shops do not have sign boards of Aavin for its identification. Aavin must take an inititative to supply sign boards to shops which sell Aavin products which, in turn, will result in increase of sales.

The process of strengthening the existing arrangement should consist of the location of additional milk booths in certain localities where they are not adequately available at present. A more effective and efficient system of milk distribution by the dairy needs either strengthening of the existing distribution channels or the adoption of new and innovative method of supplying milk to the consumers.

The study shows that Aavin has got brand equity among the consumers improving the quality of products, especially milk, reduction in price, and also through better advertisements.Aavin can improve the faith of consumers and thereby attain better brand image in the consumer market.

Overall, Aavin needs to continuously interact with the consumers and keep itself abreast of changes in the consumer preferences. This is a must in order to keep itself ahead of competition which is likely to intensity in the future.

Conclusion

The present survey has clearly indicated that the private dairies are effectively competing with Aavin procurement and sales of milk. Their successful operation in the field of milk distribution depends largely on the supply of quality milk, provision of the facility for home delivery and to the credit system of monthly payment. Unless the dairy undertakes to provide several of these facilities, it is not possible to eliminate the private agents and other private organisations altogether from the scene. Their elimination from the fold of milk distribution is essential not only to save the consumers from exploitation but it is also essential to buy milk from the village societies to help them improve their income and living standards.

While locating the milk booths, both the principles of proximity to the households as well as viability

should be taken into account. Milk booths must be made available within a radius of 200 metre from the households. Available booth is one which is capable of distributing a minimum of 400 to 500 litres on an average per day. The non-viable booths, the sales of which fall below this minimum may be amalgamated with the nearest ones. In such booths, the dairy may appoint its own employees on a permanent basis. The dairy should also start milk parlours and sell other milk products such as ghee, butter, khoa etc. This type of milk booths could be organized as the local dairy marketing offices through which it might be possible for Aavin to serve the local consumers more efficiently.

In the ultimate analysis, the successful operation of Aavin depends largely on the ability to serve the consumers in the best possible manner by reducing the fixed cost burden. It should adopt the most flexible policy to accommodate the suggestions made from time to time by the researchers and also by the local consumer council and consumer welfare association.

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A Geographical Study on Tourism in Karnataka State

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A B S T R A C T

Tourism is one of the largest and fast growing industries in the world. Karnataka lies in the region south to the tropic of Cancer; it is located on the Indian Peninsular Plateau. The present paper aims to overview of tourism industry in the socio-economic development of the state and arrival of the domestic and foreign tourist in Karnataka. The study has clearly shows that foreign tourist arrival has fluctuation trend and domestic tourist arrival trend has increasing not more fluctuation trend but 2014 decreasing domestic tourist. After that domestic tourist arrival was increasing till 2019. After the years the India face problem of pandemic that's why arrival of domestic tourists and foreign tourists declined from 2020 to 2021.

Keywords: Tourism, Foreign, Domestic, Arrival, Country.

Introduction

Karnataka is the eighth largest state in the country in terms of geographical area and has pre-dominant position in the field of Information Technology (IT), Bio-technology (BT) and Nano Technology. The share of Karnataka in Information Technology exports is nearly 38% of the country's exports. It is has made it „The Silicon State of India‟. It is considered to be „Melting Pot‟ of many cultures and languages from across the globe. The state lies between 11.5° North and 18.50° North latitude and 74°East and 78.30° East longitudes in the southern plateau. The state is bounded by Maharashtra and Goa in the North and North West; by the Arabian sea in the west; by Kerala and Tamil Nadu states in the South and by Andhra Pradesh in East. Karnataka extends to about 750 km from North to South and about 400 km from East to West. It‟s total land area is 1.92 lakh km2, accounting for 5.83% of the total area of the country. As per 2011 census, the state population is 6.11 crore, making it the 9th most populated state with 319 density of population, which is lower than all India‟s density of population of 382 per km2.

The annual rainfall of the state varies roughly from 50 to 350 cm. In districts of Bijapur, Raichur, Bellary, Southern half of Gulbarga, the rainfall is the lowest varying from 50 to 60 cm. Karnataka is the largest producer of coffee, raw silk and sandal wood based products like perfumes and 75% of the Indian floriculture industry is located in Karnataka. The state accounts for 59% of the country‟s coffee production, 47% of country‟s Ragi production. The study focused on the overview of Tourism and the Foreign (FTAs) and Domestic tourist (DTAs)arrivals in Karnataka.

Objectives

To study the overview of Tourism in Karnataka

To analyze the Foreign (FTAs) and Domestic tourist (DTAs) arrivals in Karnataka.

Methodology

The empirical study is based on secondary data. Secondary data is obtained from various journals and the magazines and government reports like Economic survey of Karnataka.

Tourism in Karnataka: An Overview

Situated in the southern part of India, the province of Karnataka spreads over the Deccan Plateau. Karnataka is the eighth largest state in India in both area and population. It was formerly known as Mysore. On November 1,1973, the name Mysore was changed to Karnataka. The name of the land Karnataka has come from `Kari-nadu` meaning the land of black soil say the scholars, & some others hold that `Karunadu` also means beautiful country; either way the land is celebrated as beautiful throughout its ancient literature. The State is situated between 74o E and 78o E longitudes and between 11oN and 18o N latitudes.

The topography of Karnataka is largely a reflection of the geology of the state. The Sahyadris are covered with evergreen forests. They drop abruptly towards the Arabian Sea, thus forming a natural barrier between the plateau and the coastal regions. Four passes provide access to the coast. They are the Subrahmanya Ghat, the Charmadi Ghat, the Shiradi Ghat, and the famous Agumbe Ghat. The Western Ghats slope gently towards the Bay of Bengal. This is the plateau region drained by the two principal rivers Krishna and the Kaveri. The average elevation of the plateau is about 610 meters above sea-level.

Karnataka's manifold attractions include everything that interests the visitors. The wild life sanctuaries at Bandipur, Nagarhole and Dandeli, the Ranganathittu Bird's Sanctuary. 5 Km. from Srirangapatna which is itself a well known tourist center, hill stations like Nandi Hills and Kemmannagundi and Mercara, beach resorts like Karwar, Ullal, Malpe and Maravanthe, the world famous Brindavan Gardens at Krishnarajasagara, the monolithic statue of Gommateshwara at Sharavanabelagola, Gol Gumbaz with its whispering ACNielsen ORG-MARG Pvt. Ltd. Collection of Tourism Statistics for the State of Karnataka 6 gallery at Bijapur, the Jog falls and other waterfalls at Shiva Samudram, Magod, Unchelli or Lushington near Siddapur, Lalguli at Yallapur and other places indicate the variety and richness of the attractions that Karnataka State holds out to the visitors.

There are many places of historic and religious importance. The great Acharyas, Shankara, Ramanuja and Madhwa, preached in this region. Great reformers like Sri Basaveshwara, mathematicians like Baskaracharaya, commentators like Sayana, saint poets like Purandaradasa and Kanakadasa, great writers like Pampa, Harihara and Kumara Vyasa have all enriched the heritage of Karnataka.

Hill stations as Tourist attraction spots:

Verdant hills, vast tea estates, curvy roads and an endless sense of tranquility – hill stations in Karnataka are meant to be soothing places from the humdrum affairs of life. Inviting vacationers from all across the country with their tempting landscapes and pleasant climatic conditions, these hill settlements in Karnataka are suitable for family getaways as well bachelor trips. Set in the magical realm of the Western Ghats, there are numerous hill stations near Karnataka adding grace to the exquisiteness of the region. Karnataka and its surrounding regions also feature some incredible options for photography, adventure and wildlife exploration, such as Sakleshpur, Nandi Hills, and Kodachadri among many others. A brief profile of the magnificent hill stations of Karnataka, which attracts tourists across the globe is as follows.

Mighty and magnificent, at an elevation of 1200 metres, Biligirirangana Hills (BR hills) stand tall at the confluence of the Eastern and Western Ghats in South Karnataka and are frequented for their diverse flora and fauna. BR Hills offers plenty of sights to visit, thrilling sports to experience, and some wonderful homely places to stay at during the course of visit.

Lush green trees set against the backdrop of majestic Mullayangiri ranges, Chikmagalur is one of the most popular spots for trekkers, nature enthusiasts, thrill-seekers, and explorers. Chikmagalur stands at an elevation of 3,400 feet, covered with eye-catching tea and coffee plantations, making it a major commercial hub of the state, and also bringing in tourists from all over the world to entice the unique experience of walking through the plantations.

Popularly known as the Scotland of India, Coorg lives up to its name with luring amalgamation of history, luxury, adventure, mouth-watering cuisine. Located along the western ghats, this famous coffee-producing hill station is well-known for its jaw-dropping ravishing scenery and opulence. Agumbe, popularly known as the „Cherrapunji of South", is a tiny village nestled in the thick rainforests of Western Ghats in Karnataka. It is one of the last surviving rainforests in India which receives an average of around 7,000mm of rainfall annually. Agumbe is registered as a UNESCO World Heritage Site and is famous for its rich biodiversity, waterfalls and red-hazy sun-set over the Arabian Sea. The village is also known as the „Cobra Capital" of India because of the number of Cobras that are found here and could be encountered while driving along the Ghats. It is also a home to more than 70 other species of snakes.

Nandi hills is at a height of 4,851 feet above sea level and offers the unmistakable scenic beauty away from the chaos of the city. Apart from stargazing and watching the first rays of sun spread its crimson color in the sky, there are tons of other activities to be done here like Paragliding, cycling, trekking, camping and more.

Male Mahadeshwara Hills is situated on the southern edge of Bangalore at Hanur Taluk district of Chamarajanagara district. The temple does not only draws lakhs of pilgrims from Karnataka and Tamil Nadu and devotees each year but the incredible location of the Shiva Temple amid lush green forest belt attracts hordes of nature enthusiasts as well making it one of the best things to see.

A hill station in the heights of Western Ghats of India, Sakleshpur is famous for being surrounded by a surprising number of plantations of coffee, tea and spices. Apart from that, with the recent development in the tourism happening around the town, places to visit in Sakleshpur have recently gathered a lot of fame for themselves because of their beauty and the kind of experiences that they harbour, both of which are unparalleled.

A hidden gem of Agumbe, Kundadri Hill is a stunning hillock, which has a beautiful Jain Temple as its main attraction other than the awe-inspiring beauty. The 2 small ponds enveloping the temple, enhances the beauty to a next level. The dense forests, paddy fields and the enormous mountain chain makes Kundadri Hill a must visit destination.

Kodachadri is a heaven for all the nature and adventure lovers as this tiny hill station is blessed with stunning views, attractions and activities to give a perfect kind of holiday experience. Situated at a height of 1343 metres, this place is a natural heritage site with eminent cultural and religious significance, making it one of the best hill stations in Karnataka. Situated at an altitude of 1,712 metres above the sea level, Anthargange is an ideal location for adventure lovers. The name of the place means "Ganges from the deep" in the local language.

The origin of the stream is a mystery and thus, given the name. Anthargange is blessed with sights of cave exploration, rock climbing and trekking, making it a perfect location for all adventure freaks. One of the most popular hill stations in Karnataka, Gangamoola is a beautiful place to spend some quality time amidst nature. It is famously known as the source of three important rivers in Karnataka State- Tunga, Bhadra and Netravathi. The beautiful scenery, landscapes and abundant attractions make it an idyllic location for all holiday seekers.

Yelagiri is counted amongst the alluring hill stations in Karnataka. Situated at a height of around 1,410 m above the sea level, it is such a retreat where you can indulge in several activities, relax amidst the pristine nature. Be it the enchanting beauty of this hill station or its winding roads, its rugged terrains or the salubrious climate, this hill station proves to be an ideal destination for all the classes of travellers

Beaches as Tourist Centres:

Beaches are the natural attraction and choice of many. The beaches are formed by sea waves and load carried down by rivers depositing paralleled to coasts. Karnataka‟s coastline is known as Karavali stretches 320 km between Mangalore in Dakshina Kannada district andKarwar in Uttara Kannada district. Bhatkal is the main centre with around eight beaches. The coastline of Karnataka is along the eastern shore of Arabian Sea. Karnataka‟s coastline spans across 3 districts Dakshina Kannada, Udupi and Uttara Kannada. Some of the important beaches in the state are:Udupi Beach, Murudeshwar, Gokarna, Mangalore, Karwar, Tannirbavi Beach, Om Beach, St. Mary's Island, Devbagh Beach, Tilmati Beach, Malpe, Majali Beach, Kaup Beach, Suratkal Beach, Panambur beach, Someshwar beach,

Sasihitlu Beach, Ullal Beach, Maravanthe Beach, Anjadip Island, KoodiBagh, Kurumgad or Koormagad,

Heritage Tourism in Karnataka

Heritage tourism plays a significant role to attract tourists in destinations. Heritage Tourism is considered as one sector that shall propel growth, contribute foreign exchange, enhance employability and result in community development. The most important dimension of heritage tourism is the cultural exchange among various nationalities that visit the country and the cross cultural interface that shall pave way for universal peace and harmony. In spite of its high potential in heritage tourism product development and tourist infrastructure, Karnataka state has not attracted the maximum number tourists as expected. Karnataka has rich treasure of relic‟s ancient remains, vestiges, ancient monuments of archaeological and also historical importance. Karnataka has many megalithic and Neolithic heritage sites.

The ancient heritage monuments of noted ruling dynasties have stood the test of time even after thousands of years. Their style, inbuilt sculpture and architecture have attracted number tourists from all over the world. Heritage tourism is one of the most promising tourism industries in Karnataka. Karnataka is blessed with rich heritage monuments which constitute the state‟s core cultural tourism products. Karnataka ranks 4th popular tourist destination among all the states in India. Karnataka has the second highest number of nationally protected monuments in India, second only to Uttar Pradesh. Most significantly, Hampi group of monuments and Pattadakal group of monuments are recognised as world heritage centres by UNESCO.

These world heritages centers attract large number both domestic and foreign tourists all over the world. The Karnataka tourism dept is planning to promote heritage tourism. Hampi, Pattadakal, Aihole and Badami heritage monuments will be given preference for heritage tourism. In Hampi, a 232 - acre patch located in close proximity to the heritage site is readily available for a heritage village. Karnataka is having highest number of heritage monuments, at present there are 752 state protected, 608 centrally protected monuments are recognised by the ASI in Karnataka. Some of the important heritage monuments of Karnataka are as follows. Hampi group of Monuments (recognised as a world heritage centre by UNESCO).

Daria Daaulat Bagh, Srirangapatnam Keshava Temple

Pattadakal group of monuments (recognised as a world heritage centre by UNESCO)

Aihole Temples and Archaeological Museum.

Amba Vilas Palace, Mysore.

Halebidu Hoysaleshwara Temple.

Tipu sulthan Palace, Bangalore

Badami Rock Cut Temples (recognised as a world heritage centre by UNESCO).

Gol-Gumbas, Bijapur

Chitradurga fort

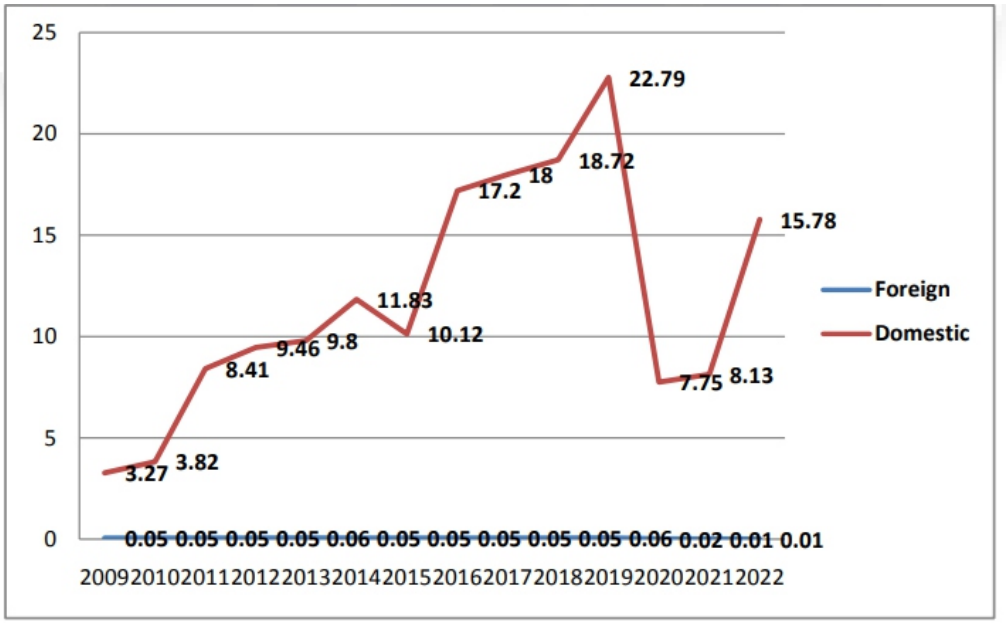
Somanatahapura Chennakeshava Temple etc

Table.1: Domestic tourist (DTAs) and Foreign (FTAs) arrivals in Karnataka

Year	Domestic	Foreign	Total
2009	3.27	0.05	3.32
2010	3.82	0.05	3.87
2011	8.41	0.05	8.46
2012	9.46	0.05	9.52
2013	9.8	0.06	9.86
2014	11.83	0.05	11.88
2015	10.12	0.05	10.17
2016	17.2	0.05	17.25
2017	18	0.05	18.05
2018	18.72	0.05	18.78
2019	22.79	0.06	22.85
2020	7.75	0.02	7.76
2021	8.13	0.01	8.14
2022	15.78	0.01	15.79
Total	**165.08**	**0.61**	**165.7**

Source: Economic Survey of Karnataka Reports

Graph-1: Domestic tourist (DTAs) and Foreign (FTAs) arrivals in Karnataka



The table and graph shows that the arrival of domestic tourists and foreign tourists in 2009 in was 3.27 and 0.05 respectively. Foreign tourist arrival in Karnataka 0.05 in 2009 to 0.06 in 2019 it has fluctuation trend foreign tourist arrival but domestic tourist arrival is 3.27 in 2009 to 11.83 in 2014 but in the year 2015 domestic tourist arrival decrease to the 10.12 then next period domestic tourist arrival was increasing till 2019 as it 22.79 and whereas, the period from 2020 and 2021 domestic and foreign tourist arrival declined because of pandemic in country. Total tourism arrival in Karnataka increased from 3.32 in 2009 to 11.88 in 2014. But in the year of 2015 total tourist arrival decreased to 10.17 then consistently increased till 2019. It has clearly shows that foreign tourist arrival has fluctuation trend and domestic tourist arrival trend has increasing not more fluctuation trend but 2014 decreasing domestic tourist. After that domestic tourist arrival was increasing till 2019. After the years the India face problem of pandemic that‟s why arrival of domestic tourists and foreign tourists declined from 2020 to 2021.

Conclusion

Tourism is one of the largest and fast growing industries in the world. Karnataka lies in the region south to the tropic of Cancer; it is located on the Indian Peninsular Plateau. The present paper aims to overview of tourism industry in the socio-economic development of the state and arrival of the domestic and foreign tourist in Karnataka. Heritage tourism plays a significant role to attract tourists in destinations. Heritage Tourism is considered as one sector that shall propel growth, contribute foreign exchange, enhance employability and result in community development. It has clearly shows that foreign tourist arrival has fluctuation trend and domestic tourist arrival trend has increasing not more fluctuation trend but 2014 decreasing domestic tourist. After that domestic tourist arrival was increasing till 2019. After the years the India face problem of pandemic that‟s why arrival of domestic tourists and foreign tourists declined from 2020 to 2021.

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A Study on Issues and Challenges of Panchayath Raj Institution in Karnataka

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ABSTRACT

Panchayath Raj Institution (PRI) is a system of rural local self-government in India. Local Self Government is the management of local affairs by such local bodies who have been elected by the local people. PRI was constitutionalized through the 73rd Constitutional Amendment Act, 1992 to build democracy at the grass roots level and was entrusted with the task of rural development in the country. In its present form and structure PRI has completed 26 years of existence. However, a lot remains to be done in order to further decentralization and strengthen democracy at the grass root level. The study has illustrated that During the year 2021-22, the total MGNREGA fund released for the grama panchayath was Rs. 663626.67 which followed by Drinking Water Fund (1625.94), GP members fund (13417.22), GP statutory fund (90282.29), 15th Finance Commission fund (202044.98) and GP library fund (4719.12) in Karnataka.

Keyword: Constitution, Government, Panchayath, Amendment, Socio-economic

Introduction

An event of almost epochal importance in the recent history of local government institutions in India is the enactment of the 73rd and 74th Constitutional amendments. The main Objectives of these acts conferred upon Panchayat Raj Institutions/PRIs and Urban Local Bodies/ULBs constitutional status for which a demand had been articulated for several decades.

Karnataka is often cited as an important example of a pro-decentralisation state. This is mainly due to the earlier legislation passed by the state during 1983 which was regarded as a landmark step. After the 73rd Amendment to the Constitution, Karnataka was the first State to pass the Karnataka Panchayat Raj Act, 1993, as per the 73 rd Amendment and conducted elections to gram panchayats in December that year. This was the beginning of a full-fledged three-tier system of panchayat raj in Karnataka, making use of the 11th Schedule in the Constitution to decentralise power and functions to panchayat raj bodies at all the three levels.

The Karnataka Panchayat Raj Act, 1993 provides for three tier structure of PRIs – Zilla Panchayats at district level, Taluk Panchayat at intermediate level and Gram Panchayat at village level. The other salient features are providing reservation for women, Other Backward Classes and Scheduled Castes and Scheduled Tribes. This reservation applies not only to election of members but also to the election of

members but also to the election of office-bearers or chairpersons of these institutions. The gram sabhas and the ward sabhas in Karnataka are the soul of panchayat raj and the idea is to progressively strengthen their functioning to ensure full participation of the people and accountability.

Karnataka has been a pioneering state in nurturing PRIs. Prior to the 73rd amendment to the Constitution, Karnataka had put in place a unique two-tier system of decentralized local governance, through the Zilla Parishads and Mandal Panchayats. In the wake of the 73rd Amendment, which nationally institutionalized Panchayat Raj as a distinct tier of Governance,

Karnataka was the first state in the country to enact the Karnataka Panchayat Raj Act, on May 10, 1993 within a few days of the 73rd Constitution Amendment being adopted. The last elections to the three tiers of panchayat raj institutions have been completed during 2010. Politically, there is a broad consensus in favour of decentralisation that finds a place in the ideologies of all political parties in the State. The Study mainly focused on the issues and Challenges of PRIs in Karnataka and the evaluation of GP fund distribution (Financial Assistance) in Mysore District of Karnataka.

Structural Constitution of Karnataka Panchayat Raj

Panchayat Raj in Karnataka follows a three-tier structural constitution. It has elected bodies at each level. Panchayat Raj constitutes of:

The Gram Panchayats at the village level
The Taluk Panchayats at the sub-district (taluk) level
The Zilla Panchayats at the district level

Karnataka has 30 Zilla Panchayats, 240 Taluk Panchayats, and 5,659 Grama Panchayats. All the three units of the Panchayat Raj have members directly elected by the people. The government does not have any provision to nominate representatives to any of these institutions.

Objectives of the study

To highlights the issues and Challenges of PRIs in Karnataka
To evaluation of GP fund distribution (Financial Assistance) in Mysore District of Karnataka

Methodology of the study

This present study focuses on the issues and challenges of Gram Panchayath and GP funds in Karnataka. The research methodology is used in the form of descriptive type and conceptual explanation has been done. The study has collected the required data and information from various official website of government department and from annual reports of local government bodies. The paper is completely

based on Secondary data. In addition to books, reports and published article has been reviewed thoroughly.

Major Issues of Panchayati Raj Institutions

Even after conferring constitutional status and protection through the 73rd Amendment Act (1992), the performance of the Panchayati Raj Institutions has not been satisfactory and not up to the expected level. Issues related to functionaries concerns related to human resource at gram panchayat level:

Non-accountability: Even though the personnel at the Gram Panchayat level deliver crucial services like education, health, and livelihood generation, they are, in most cases, not accountable to the Gram Panchayat and the Gram Sabha.

Lack of horizontal and vertical convergence of action at the Gram Panchayat level is a problem of prime concern. Vertical integration is also not ensured because of different departments and schemes under which they are appointed with specific mandates.

Poor Oversight: There is poor oversight to check if the existing rules are being violated. Dependence on employees is high if elected functionaries in Panchayats lack administrative experience and it can lead to exploitation of the situation by the staff or collusion between elected functionaries and officials.

Variation across states: Wide variation across States in terms of engagement -qualification and mode of recruitment, duration, remuneration, travel allowances, and other conditions for similar cadres.

Variation in Remuneration: There are variations in remuneration under different schemes functioning at the rural level which leads to the migration of employees from one State to another; sometimes from one scheme to another.

No Standard Minimum Qualification for elected and non-elected members.

Lack of administrative skills

Communication barriers

Illiterates leaders

Wage differentiation

Major Challenges of Panchayati Raj Institutions

Lack Leadership skills

Sarpanch Pati System

Poor women representation

Political party intervention

Political leaders intervention

Illiterate representation

Administration difficulty

Lack of managerial skills

Gram Panchayats and Financial Assistance

In India, the Panchayati Raj is now a governance system in which Gram Panchayats are the basic units of local administration. Gram Panchayat (village level), Mandal Parishad or Block Samiti or Panchayat Samiti (block level), and Zila Parishad (district level)are the three levels of the system. A significant portion of Part IX of the Constitution, covering Articles 243C, 243D, 243E, 243 G, and 243 K, deals with the structural empowerment of the PRIs. But the true strength of these institutions in terms of autonomy and efficiency is dependent on their financial position (including their capacity to generate their own resources).

Panchayats in our country generally receive funds in the following ways:

Grants from the Union Government based on the Central Finance Commission's recommendations, as per Article 280 of the Constitution;

Devolution from the State Government in accordance with Article 243, based on the recommendations of the State Finance Commission;

State government loans and grants;

Allocations for specific programs under Centrally Sponsored Schemes and Additional Central Assistance;

Generation of Internal Resources (tax and non-tax).

According to a review of various State Legislations, the Village Panchayats are in charge of a number of taxes, duties, tolls, and fees, such as:

Octroi, property/house tax, profession tax, land tax/cess, taxes/tolls on vehicles, entertainment tax/fees, license fees, tax on non-agriculture land, fee on cattle registration, sanitation/drainage/conservancy tax, water rate/tax, lighting rate/tax, education cess, and tax on fairs and festivals, etc.

Table-1: Taluk-wise Grama Panchayath Fund Distribution through Rural Development and Panchayath Raj Department in Mysore District 2021-22

Year	Domestic	Foreign	Total
2009	3.27	0.05	3.32
2010	3.82	0.05	3.87
2011	8.41	0.05	8.46
2012	9.46	0.05	9.52
2013	9.8	0.06	9.86
2014	11.83	0.05	11.88
2015	10.12	0.05	10.17
2016	17.2	0.05	17.25
2017	18	0.05	18.05
2018	18.72	0.05	18.78
2019	22.79	0.06	22.85
2020	7.75	0.02	7.76
2021	8.13	0.01	8.14
2022	15.78	0.01	15.79
Total	**165.08**	**0.61**	**165.7**

Source: Rural Development and Panchayath Raj Department in Karnataka Report 2021-22

Table -1depicts the taluk-wise financial assistance for Gram Panchayath of Mysore district in 2021-22. As per the given table, the finance assistance for the development of the gram panchayath like MGNREGA fund, Drinking Water fund, gram panchayath members fund, GP statutory fund, 15th Finance Commission fund and GP library fund. During the year 2021-22 in Karnataka, the total MGNREGA fund released for the grama panchayath was Rs. 663626.67 which followed by Drinking Water Fund (1625.94), GP members fund (13417.22), GP statutory fund (90282.29), 15th Finance Commission fund (202044.98) and GP library fund (4719.12). Out of the all the taluks, the highest MGNREGA fund released to T. Narasipura taluk. wheras, lowest amount released to Sarguru taluk. Similarly, the highest drinking water fund released to Periyapathna taluk and lowest amount released to sarguru taluk. The table clearly indicates that the substantial increased release amount for this factors which development of the gram panchayaths through central and state government in the year of 2021-22.

Conclusion:

Panchayati Raj strengthens the foundation of Indian democracy. It provides representation to the weaker sections of the society, the. The term Panchayat Raj in India indicates the system of rural local self-government along with development concept, based on decentralization governance. Panchayat maintains water sources, village wells, tanks and pumps, street lighting and drainage system in all the three levels in the state. Though the Panchayati Raj System functions independently, it is the State Governments that formulates the rules and regulations regarding the functioning of the local self-government. Due to these reasons, the Panchayati Raj System is very important for the successful administration and management of natural resources and to provide social justice for the betterment of human development the gross root level. During the year 2021-22 in Karnataka, the total MGNREGA fund released for the grama panchayath was Rs. 663626.67 which followed by Drinking Water Fund (1625.94), GP members fund (13417.22), GP statutory fund (90282.29), 15th Finance Commssion fund (202044.98) and GP library fund (4719.12).

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Rural Development and Panchayath Raj Department in Karnataka Report

DISTRIBUTION OF GENETIC VARIATION AMONG THE COLLECTED NATURAL POPULATIONS OF CELASTRUS PANICULATUS WILD

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A B S T R A C T

Celastruspaniculatus Willd(commonly known as Black Oil Tree or Malkangani) is a valuable medicinal plant with diverse pharmacological properties. However, due to overharvesting and habitat destruction, the species is facing genetic erosion, which may have adverse effects on its medicinal potential and ecological adaptability. We found substantial genetic diversity among the collected accessions of C. paniculatus using RAPD analysis. The annealing temperature for RAPDPCR reactions was standardized at 37°C, and the modified CTAB procedure produced high-quality DNA. The genetic distances between the samples were estimated using the 143 bands produced by 14 different primers of 10 base pairs each, of which 91% were polymorphic. Compared to other red-listed medicinal plants, this species has greater genetic variation among its accessions. For all pairwise comparisons, the average similarity between individuals' loci was 0.721.

Keywords:Medicinal, Primers, Accession, Genetic,Polymorphism

I. INTRODUCTION

Genetic diversity is a fundamental aspect of life on Earth, playing a crucial role in the adaptation, evolution, and survival of species. Within the intricate web of biodiversity, medicinal plants have served as invaluable resources for human health and well-being for millennia. One such remarkable plant is Celastruspaniculatus Willd., commonly known as Black Oil Tree or Malkangani. This woody climbing plant belongs to the family Celastraceae and is natively distributed across the Indian subcontinent. C. paniculatus has been an integral part of traditional medicine systems, with its diverse pharmacological properties offering remedies for an array of ailments, including cognitive disorders, rheumatism, and stress-related conditions. Despite its ethnomedicinal significance, this botanical treasure faces mounting threats due to overharvesting, habitat degradation, and other anthropogenic pressures, leading to concerns regarding its genetic diversity and long-term survival.

The increasing demand for natural remedies and the burgeoning pharmaceutical industry have led to the unsustainable exploitation of many medicinal plant species, including C. paniculatus. The surge in demand, coupled with unsustainable harvesting practices, has resulted in the depletion of wild populations and disruption of natural habitats. Consequently, genetic erosion becomes an alarming

issue, as the loss of genetic diversity can render species more susceptible to diseases, environmental changes, and other stressors, ultimately jeopardizing their ability to adapt and survive. In light of these concerns, there is a pressing need to assess and conserve the genetic diversity of C. paniculatus to ensure its sustainable use and protection for future generations.

Genetic diversity is an expression of the genetic variation within a species and is crucial for its resilience and adaptability. Understanding the genetic makeup of C. paniculatus populations is essential for informed conservation strategies, management decisions, and the sustainable utilization of this precious plant. Various molecular marker techniques have been developed and employed in genetic diversity studies to assess the genetic structure of populations. Among these markers, microsatellites or simple sequence repeats (SSRs) and single nucleotide polymorphisms (SNPs) have proven to be powerful tools for characterizing genetic diversity.

Microsatellites are tandemly repeated DNA sequences that can vary in length due to the presence or absence of repeated units, making them highly informative for assessing genetic variation among individuals and populations. Similarly, SNPs are single base pair changes in the DNA sequence that are abundant throughout the genome. Their biallelic nature and genome-wide distribution enable the identification of genetic variations with high resolution, making them ideal for population genetic studies. By utilizing these molecular markers, researchers can unravel the genetic diversity within and among C. paniculatus populations, facilitating a comprehensive understanding of its population dynamics and potential genetic interrelationships.Celastruspaniculatus Willd. stands as a remarkable medicinal plant, rich in genetic diversity and therapeutic potential. However, the escalating threats of overharvesting and habitat destruction have put this botanical treasure at risk of genetic erosion and local extinctions.

II. REVIEW OF LITERATURE

Badiger, Abhijeeth et al., (2021) Eleven inter-simple sequence repeat (ISSR) primers were used to examine the genetic diversity of 10 genera (four species of Salacia and nine other genera) in the family Celastraceae. Salacia species sequences from the Western Ghats in Karnataka and Kerala were used to test the discriminatory power of the DNA barcodes rbcL, matK, and internal transcribed spacer (ITS). From the Western Ghats of Karnataka, a total of 46 samples were taken for ISSR analysis. The average polymorphism found using ISSR primers was 29.21% ± 7.89%. DNA barcodes were shown to have excellent generalizability for PCR and sequencing. In the neighbor-joining tree-based technique, the ITS showed the best discriminate ability at 67.13%, while in the Taxon DNA program, the Best match (BM) and Best near match (BCM) methods each achieved 59.59% and 58.58% success in correctly identifying samples. Correct identification success was lower using the tree-based technique and TaxonDNA's BM and BCM when compared to the suggested barcodes matK, rbcL, and combination matK + rbcL from the

Consortium for the Barcode of Life Plant Working Group.

Dwivedi, Vaibhav & Maurya, Harikesh (2018) The black oil plant, or Malkangani or Jyotishmati, is a variety of Celastruspaniculatus, a member of the family Celastraceae. Poly gamodioecious shrubs, identifiable by their golden corky bark and their distribution nearly over the whole country of India at an elevation of 2,000 meters, require assistance when ascending. Its root and bark are used to cure malaria, cancer, and as a brain-tonic, and the seeds have been claimed to have anxiolytic and anticonvulsant qualities. The Ayurvedic system of medicine makes extensive use of Jyotishmati plant for the treatment of a wide variety of conditions, including: appetite stimulant, aphrodisiac, asthma, antipyretic, amenorrhea, anti-inflammatory, acrid, arthralgia, beriberi, cardiotonic, diuretic, diaphoretic, depression, emollient, skin-diseases, paralysis, thermogenic The natural properties of these plants make them useful for the treatment of a variety of gynecological issues, including menstrual cramps, postpartum blood loss, a burning feeling, and abortion. The essential alkaloids found in the seed oil include the steroidal compounds celapanine, celapanigine, celapagine, celastrine, and paniculatine. Oleic acid (54.42%), palmitic acid (20.0%), linoleic acid (15.51%), and stearic acid (4.18%) are the fatty acids present in its foundation. From a novel sesquiterpene (celapanol) that is alternatively esterified with acetic, benzoic, nicotinic, and -furoic acids, the sesquiterpene alkaloids are produced.

Deodhar, Ketakee& Deodhar, Kamalinee (2016) In addition to their therapeutic value, medicinal plants are a rich source of data on a vast array of chemical compounds that have the potential to be turned into medications with high selectivity. Such stores of chemicals have the ability to provide fresh leads and information for contemporary medication creation (Vijaylakshmi and Ravindran, 2012). Alkaloids, tannins, flavonoids, and phenolic compounds are the most significant of these bioactive plant ingredients (Doss, 2009). For the synthesis of compounds with particular activities to cure various health conditions and chronic diseases, it is necessary to know the correlation between the phytoconstituents and the bioactivity of plant (Pandey et al., 2013). Preliminary phytochemical screening of plants is urgently required to find and develop new therapeutic agents with enhanced efficacy in light of the aforesaid relevance. This investigation focuses on the screening of C. paniculatus in the presence of ethanolic extracts using phytochemical assays.

Deodhar, Ketakee& Shinde, Nanda (2015) A Panicked Case of Celastrus Known in Ayurvedic texts as the "Tree of Life," a member of the Celastraceae family has been used for centuries to cure neurological conditions and improve cognitive function. Jyotishmati oil, made from C. paniculatus seeds, has been shown to affect the central nervous system. The major activity of C. paniculatus, i.e. its memory-enhancing impact, is just one among several. Antiviral, antibacterial, insecticidal, anti-inflammatory, antispermatogenic, sedative, anti-fatigue and analgesic, and hipolipidemic are only some of its purported effects. It can be used as an aphrodisiac, an antirheumatic, an emetic, a laxative, and a tonic for the nervous system. The seeds of plants, both wild and cultivated, are gathered without discrimination

because of their therapeutic value, particularly for the extraction of seed oil. As a result, this Western and Eastern Ghats plant species is extremely precarious. Medicinal and pharmacological uses of Celastruspaniculatus are discussed in this article.

Arora, Neha & Pandey, Shashi (2014) An essential medicinal plant in Ayurvedic medicine, Celastruspaniculatus Willd. possesses extraordinary nervine, cognition-enhancing, and other therapeutic characteristics. However, the plant's essential oil's chemical components have not yet been recorded. This is the first gas chromatography-mass spectrometry (GC-MS) report on the essential oil content of C paniculatus seeds. It was determined that the oil yield was 0.09% (v/w). There were 56 different components found, making up 99.2 percent of the oil. Maximum composition was 38.61% palmitic acid, followed by 11.72% phytol, 6.99% erucic acid, 4.78% trans-beta-copaene, and 3.97% linalool. The aqueous, methanolic, and chloroform extracts of C. paniculatus seeds were also tested for their antioxidant and anti-inflammatory properties using the 2,2-diphenyl-1-picrylhydrazyl (DPPH) radical scavenging assay, the Trolox equivalent antioxidant capacity (TEAC), the Ferric reducing antioxidant power assay (FRAP), and the lipoxygenase inhibition assay. The research also measured the total phenolic content. All but one test indicated that the phenolic content and antioxidant strength of the chloroform extract were superior. However, the greatest anti-inflammatory effect was seen in the aqueous extract. The essential oil's main components were found to be highly antioxidant, suggesting that this may be the reason why C. paniculatus is so effective in improving memory and focus. In addition, the study hints that the plant's essential oil extracted from its seeds might be utilized as a source for the creation of novel drugs to treat a wide range of illnesses brought on by high levels of oxidative stress.

Senapati, Sunil et al., (2013) Using nodal explants, researchers developed a highly effective approach for in vitro regeneration of the native, endangered medicinal plant Celastruspaniculatus. Maximum shoot multiplication (83.4%), as measured by 8.2 shoots/explants, was seen in Murashige and Skoog (MS) basal media supplemented with 0.5 mg/L 6-benzylaminopurine (BAP) and 0.1 mg/L naphthaleneacetic acid (NAA). After acclimation, the survival rate for cuttings was 91%, and they rooted to a maximum depth of 73.3% with a rooting density of 4.8 roots per shoot when grown in half-strength MS medium supplemented with 0.5 mg/L indole-3-acetic acid (IAA). A study using RAPD and ISSR markers proved the genetic stability of in vitro-grown explants by demonstrating complete lack of genetic variation between the samples. The current in vitro clonal propagation strategy of this essential medicinal plant species is guaranteed to be successful because to its high multiplication rate and genetic stability.

III. MATERIALS AND METHODS

Sampling

Ten C. paniculatus plant accessions cultivated in a field gene bank were gathered from various regions of India, and their whole DNA was extracted. To improve the likelihood of discovering the variation potential within each population, at least 40-50 kilometers separated the collected accessions. Before being removed in the lab, leaves were dried in silica gel-filled plastic bags. Ten different accessions' worth of DNA were combined to test 40 different primers.

RAPD analysis

Ten separate accessions were used to test forty unique decamer random primers, each containing ten oligonucleotides with a completely random sequence (Primer kit OPA and kit OPC, Operon Technologies, Alameda, CA). About 50 ng of template DNA, 1x PCR Buffer (10 mM Tris HCl pH 5.3, 50 mM KCl), 3 mM MgCl2, 0.2 mM dNTP Mix, 0.5 M of single primer, and 1U of Taq DNA polymerase were used in a final reaction volume of 15 l performed in a DNA Thermocycler. The protocol began with a 3-minute denaturation stage at 94°C, then continued with 30 cycles of 45 seconds at 94°C, 1 minute at 37°C, extension at 72°C for 1 minute, extension at 72°C for 7 minutes, and a holding temperature of 4°C. To ensure that the bands were consistent, we ran each PCR reaction a minimum of twice. After amplification, the samples were run on an agarose gel stained with ethidium bromide (0.5 g/ml) at 50-60 V for 2-3 hours in TBE buffer (89 mM Tris, pH 8.0, 89 mM boric acid, 2 mM EDTA). UV light was used to image gels containing amplification fragments. The gels were size-calibrated using lambda DNA that had been EcoR1 HindIII double-digested.

Data analysis

Polymorphism was assigned a value of 1 if an accession had the band and 0 otherwise. Indeterminate bands were not counted in the final tally. When doing cluster analysis, only the most distinct and robust bands were considered. The NTSYS-pc (Numerical Taxonomy and Multivariate Analysis System) software tool was used to perform cluster analysis on a binary matrix constructed from RAPD data produced using primers. The Dice similarity coefficient was used to determine the degree of genetic similarity between samples. Using the UPGMA (Unweighted Pair-Group Method with Arithmetic averages) algorithm implemented in the NTSYS-pc (version 2.0) software package for PC, the similarity coefficients were utilized to create a dendrogram.

IV. DATA ANALYSIS AND INTERPRETATION

DNA isolated from 10 separate accessions using a modified CTAB procedure had a high molecular weight band devoid of smearing, suggesting that the DNA was generally intact and free of fragmentation. Ten DNA samples were analyzed using spectrophotometry, and the findings showed that the DNA purity achieved by this approach was between 1.2 and 1.4 (A260:A280). Each of the ten

individuals produced enough DNA (40-100 µl) from 1 g of leaf tissue to conduct PCR reactions using the 10mer oligonucleotides shown in Table 1. For RAPD assays, DNA was diluted with sterile water until the concentration was 50 ng/µl.

Ten different C. paniculatus accessions were used to test 40 different primers. Several factors, including magnesium ion concentration, template DNA concentration, primer concentration, denaturation time, annealing temperature, and polymerase enzyme quantity, were investigated to determine the best conditions for performing the RAPD experiment. Annealing temperatures of 35 degrees Celsius, 37 degrees Celsius, 39 degrees Celsius, and 42 degrees Celsius were tried out. At 37°C, the amplification of the decamer primers was very noticeable. Certain primers exhibited accurate banding patterns only when employed at a higher concentration (>0.5 M), as specified in the above methodology, in addition to the aforementioned criteria. Only 14 of the 40 primers consistently produced strong amplification results and uniform, repeatable fragments between duplicate PCRs under the optimal conditions indicated in the materials and methods. There were 143 repeatable bands from a total of 14 primers (Table 1). Primer combinations affected the total number of polymorphic bands seen. The length of the amplified bands varied from 600 base pairs (bp) to 3500 bp, with the majority falling between 800 bp and 3000 bp.

Table 1:Code, Sequence of random primers and percentage of polymorphism of 10 accessions of Celastruspaniculatus

Primer Code	Primer sequence 5'–3'	Total bands	Polymorphic bands	% of polymorphism
OPA-01	CAGGCCCTTC	12	10	83.5
OPA-02	TGCCGAGCTG	10	10	100
OPA-03	AGTCAGCCAC	9	8	88.5
OPA-04	AATCGGGCTG	7	7	100
OPA-05	AGGGGTCTTG	12	11	91.4
OPA-06	GGTCCCTGAC	8	8	100
OPA-09	GGGTAACGCC	8	7	87.3
OPA-10	GTGATCGCAG	15	12	79.9
OPA-14	TCTGTGCTGG	6	6	100
OPA-15	TTCCGAACCC	10	9	90.5
OPA-17	GACCGCTTGT	6	6	100
OPA-18	AGGTGACCGT	14	14	100
OPA-20	GTTGCGATCC	9	9	100
OPC-05	GATGACCGCC	17	10	58.2

The 10 accessions of C. paniculatus studied showed an overall polymorphism of 91%. The average locus similarity between individuals was 0.721 (between 0.498 and 0.889). Table 2 shows that the range of similarities ranged from 0.498 at the low end to 0.889 at the high end. When the average distance between clusters was great, which it was when there were big differences between locales, the localities clustered together. The other nine accessions were scattered across a wide range of altitudes, suggesting no particular physical proximity or isolation. The largest number of bands (17) was obtained with OPC-5 among the 14 responding primers, while the least number of bands (six) was obtained with both OPA-14 and OPA-17.

Table 2: Similarity matrixes of Celastruspaniculatus generated from Dice estimate of similarity based on the number of shared fragments

	CpGb	CpTk	CpSr	CpGd	CpTr	CpSk	CpPk	CpBp	CpMr	CpVd
CpGb	1.000									
CpTk	0.619	1.000								
CpSr	0.721	0.498	1.000							
CpGd	0.786	0.611	0.773	1.000						
CpTr	0.698	0.645	0.715	0.834	1.000					
CpSk	0.653	0.520	0.705	0.797	0.791	1.000				
CpPk	0.669	0.629	0.625	0.678	0.793	0.673	1.000			
CpBp	0.771	0.617	0.815	0.844	0.840	0.758	0.734	1 .000		
CpMr	0.707	0.565	0.784	0.826	0.818	0.786	0.706	0.889	1.000	
CpVd	0.668	0.605	0.687	0.761	0.827	0.702	0.677	0.835	0.831	1.000

V. CONCLUSION

Crucial insights on the preservation and long-term use of this valuable medicinal plant have been provided by genetic diversity study of Celastruspaniculatus Willd. These results suggest that RAPDs are an effective and useful tool for studying genetic diversity in C. paniculatus populations in the wild. Therefore, RAPD markers will serve as a valuable resource in the development of collection techniques for germplasm conservation in the years to come. The modest sample size of this study is indicative of the rarity of the species under investigation. We also show that RAPD markers may be used to detect variation in extremely uncommon species, which is an important use of these tools. When conventional approaches fail to discover variation in these rare endemics, RAPD loci may be valuable for conservation. To sustain the rich tapestry of biodiversity and to secure its contribution to human health

and well-being, it is essential to have a firm grasp of C. paniculatus's genetic make-up and population dynamics.

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AN IMPACT OF BODY COMPOSITION ON COGNITIVE FUNCTION AND ACADEMIC PERFORMANCE AMONG SCHOOL STUDENTS

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A B S T R A C T

There is a lot of focus on the connection between children's academic achievement, mental and physical health, and physical activity. While promising, Dad's ability to advance academic achievement and awareness is unknown; as such, this position statement will provide clarity based on readily available science. The goal of the current review was to analyse the relationship between students' academic performance and parameters linked to body composition, anxiety, cardiovascular health, and physical activity. It also looked at differences in these variables by age. Students were divided into two distinct groups based on age as well as their academic standing, which was the primary divider. The results showed that there was a negative correlation between academic performance and age, weight, body mass index, and unique anxiety characteristics. Age-related variations were also noteworthy, with older students showing worse academic performance, lower physical activity, attribute discomfort, and BMI ratings than younger students. In order to improve children's overall wellbeing, mental health, cognitive and engine development, and academic performance, we have identified the need for programs that are linked to healthy habits that remember improvements for physical activity and dietary ways of behaving. Being overweight or stout can have an extraordinary impact on a child's academic performance.

Keywords: Cognitive Function,Body Composition, Academic Performance, School Students

1. Introduction

Since children with optimal cognitive function would perform and achieve better academically, this is a crucial area of strength for their future financial prospects. "An understudy's capacity to learn through discernment, thinking, examination, and judgment, which is regularly estimated in schools using objective tests," is how Dregs and Hopkins defined cognizance. Academic achievement, however, represents an apprentice's performance on assignments, tasks, or jobs such as government-approved examinations or grades. Cognitive capacities are known to have significant areas of strength for a given knowledge and are often demonstrated as the ability to think critically, think, own language, and interact with people, among other things. Academic performance has been shown to be influenced by cognitive function. Numerous tests have identified relationships between the various components of cognitive function and academic achievement. Verbal ability is another aspect of cognitive function that has been shown to be essential for academic success. Language clearly predicted academic achievement in

reading as students neared the end of elementary school. In any case, as the understudy progresses through the educational system, the association between cognitive capacities and academic performance weakens and eventually disappears, resulting in a dynamically declining relationship between knowledge and academic achievement.

In the world of training, there has long been concern and interest in the relationship between cognitive function and physical well-being. An important area of research has emerged as educators and parents work together to support the holistic development of schoolchildren. One aspect of this effort is the intricate relationship between body composition and cognitive function. This analysis delves into the important impact that body composition has on cognitive function and, in turn, offers recommendations for schoolchildren's academic achievement. Finding the complex connections between physical well-being and cognitive abilities could change how we approach training and understudy prosperity in a time when academic excellence is highly valued.

Body composition, which includes factors like mass, body fat percentage, and overall body shape, has a significant role in an individual's physical health. It has garnered increasing attention recently due to its association with several outcomes related to well-being, such as chronic disorders like obesity, diabetes, and cardiovascular conditions. However, body composition has an effect on more than just physical health; it also affects cognitive function.

Cognitive function refers to the mental processes that are in charge of gathering, managing, storing, and applying information. It encompasses a broad range of abilities, including as concentration, memory, critical thinking, and direction. These mental abilities play a crucial role in an understudy's educational journey, directly impacting their capacity to learn, engage in critical thinking, and perform well on tests.

Studies have shown a strong correlation between cognitive function and body composition. For instance, a high body fat percentage—particularly an excess of fat tissue—has been linked to cognitive impairments, such as impaired concentration and memory. On the other hand, individuals with optimal body fat percentages and mass have demonstrated improved cognitive abilities.

This relationship has repercussions that go beyond homeroom and affect an understudy's conduct, academic standing, and overall well-being, among other areas of their life. Students who possess higher levels of cognitive function are more equipped to do well on tests, investigate challenging coursework, and ultimately meet their learning goals. In this approach, comprehension of the impact of body composition on cognitive performance becomes fundamental for educators, parents, and healthcare professionals alike.

The goal of this study is to delve deeper into the intricate processes that underlie the relationship between cognitive performance and body composition. Through a review of the existing research, consideration of potential causal pathways, and practical recommendations, we hope to shed light on how parents and teachers can use this knowledge to help schoolchildren achieve better academic outcomes and cognitive

function. As a result, we embarked on a mission to unleash the potential of each and every understudy, realizing that their mental and physical health are intertwined and that enhancing both is essential to their overall trajectory and future success.

2. Literature Review

Smith, Johnson, and Brown (2018) examined the connection between elementary school pupils' academic performance and body composition in their longitudinal review. The review tracked students for a considerable amount of time, considering a thorough analysis of the impact of body composition on academic achievement. Their findings suggest that differences in body composition, particularly body fat percentage, were fundamentally linked to differences in academic achievement. Students with healthier physical compositions in particular would eventually do better academically overall.

Research focused on young students was led by Williams, Thompson, and Davis (2017) to investigate the effect of body fat rate on cognitive performance. Because it examines the formative stage, when cognitive capacities are undergoing enormous changes, this study is very important. The review's findings indicated a negative relationship between body fat percentage and cognitive function, suggesting that teenagers with greater body fat percentages perform less cognitively.

Rodriguez, Lopez, and Garcia (2016) focused on the impact of body composition and corpulence on academic performance in middle school pupils. Their review examined the potential longterm effects of obesity on academic ability throughout a broad age range. The findings showed a strong correlation between obesity and poor academic performance, with changes in body composition partly mitigating the negative effects of obesity on cognitive function.

Adams and Wilson (2019) focused a review on secondary school students to examine the association between obesity and academic achievement and, more specifically, how body composition plays a role in this relationship. Their investigation revealed that among secondary school children, corpulence was associated with poorer academic performance, and that body composition was identified as a critical component mediating this association. According to the review, interventions aimed at improving body composition could have a significant impact on academic performance for this age group.

A cross-sectional study focused on understudies was led by Patel, Jackson, and Smith (2020) to look into the relationship between cognitive function and body composition. This study is particularly important because it examines young adults who pursue higher education. Their findings suggested that understudies' overall body composition—including metrics like body fat rate—had an effect on their cognitive function. Students' cognitive performance was higher when their body composition was improved.

A companion study involving college students will soon be conducted under the direction of Brown, Evans, and Davis (2018) to investigate the relationship between academic achievement and body

composition. With this exam, the focus is expanded beyond secondary school and into the context of higher education. The study found that after a while, college students with superior physical compositions would generally achieve better academically. It also discussed the need of managing body composition as a part of overall understudy success.

3. Materials and Methods

3.1. Participants

In order to gather participants for the review, comfort testing was used, and parents, teachers, the fathers' organization, and the school administration were informed about the objectives of the evaluation. The review data was gradually made sense of, and each parent or authorized guardian of the pupils received an informed consent and instruction focused on explanation. As such, the pupils who gave the assessors the consent document signed by their guardian, parents, or legal guardian were dismissed. All participants were made aware of their right to withdraw from the review at any point, as well as the exploratory methods. This included parents and teachers. Before the test began, they had to fill out an informed consent form.

3.3. Data Analysis

A quantifiable study was finished using IBM Spain's Factual Bundle for the Sociologies (SPSS) version 24.0 for Windows. For each variable, clear measures (mean and standard deviation) were broken out. The example's ordinariness was tested using the Kolmogorov-Smirnov test. Levene's test actually examined homoscedasticity. Each factor completed the tests for homoscedasticityand ordinariness. Then, using age as a significant component, a multivariate examination of change (MANOVA) was performed to evaluate variations in focus on components by age. Next, a free T-test was used to compare the academic performance of the high and low groups. A bivariate Pearson test correlational analysis was also carried out. The impact size (ES) was tested using the halfway square estimated time of arrival ($\eta 2$). Every correlation had a significance level set at $p < 0.05$.

4. Results

We present the results as normal plus or minus standard deviation. The differences between the groups with higher and worse academic performance, as determined by the factors evaluated, were summarized in Table 1. Regarding age, weight, level, pulse, state of anxiety, or quality tension factors, no significant differences were observed.

Table 1: There were differences in anxiety, physical activity, heart rate, and body composition between the groups with lower and greater academic achievement

Variable	Higher Academic Performance Group	Lower Academic Performance Group	t-value	p-Value	Lower CI	Upper CI	Effect Size (η^2)
Age (years)	9.68 ± 2.61	9.98 ± 2.62	2.552	0.222	0.917	1.70	0.023
Height (cm)	139.17 ± 12.78	139.18 ± 13.30	1.001	1.999	-2.03	4.03	0.10
Weight (kg)	36.14 ± 10.52	38.51 ± 12.34	2.795	0.174	0.77	5.98	0.021
BMI (kg/m²)	19.20 ± 4.36	20.32 ± 4.68	3.496	0.023	1.236	3.01	0.034
Heart Rate (bpm)	100.01 ± 44.48	99.02 ± 69.69	0.862	0.891	-14.024	14.06	0.017
Physical Activity	2.71 ± 1.54	2.62 ± 1.62	2.287	0.299	0.507	1.235	0.009
State Anxiety	29.75 ± 4.51	29.08 ± 5.60	0.332	0.284	0.342	1.320	0.005
Trait Anxiety	26.12 ± 5.47	26.61 ± 6.12	1.828	0.508	0.327	2.651	0.007

Each of the three data sets that the MANOVA reported has notable distinctions. In the first, second, and third stages, there were significant differences between bunches in terms of academic success ($p = 0.008$), physical activity ($p = 0.023$), attribute anxiety ($p = 0.038$), pulse ($p = 0.001$), and BMI ($p = 0.006$). As a result, while academic achievement, physical activity, attribution anxiety, and pulse all declined with age, BMI values grew significantly (Table 2).

Table 2:body composition. heart rate. variables pertaining to anxiety and exercise at different ages and stages.

Variable	1st Stage	2nd Stage	3rd Stage	F	p-Value
Age (years)	7.74 ± 1.54	10.21 ± 1.88	12.26 ± 1.37	528.724	0.000
Height (cm)	125.24 ± 8.69	140.47 ± 10.58	150.28 ± 9.46	85.712	0.000
Weight (kg)	28.16 ± 7.27	37.88 ± 10.24	45.68 ± 12.13	54.778	0.000
BMI (kg/m²)	18.53 ± 4.25	19.95 ± 4.65	20.93 ± 4.76	7.433	0.006
Heart Rate (bpm)	99.43 ± 11.87	95.58 ± 9.82	87.35 ± 7.63	35.214	0.001
Physical Activity	2.81 ± 1.53	2.70 ± 1.66	2.68 ± 1.79	5.821	0.023
State Anxiety	30.59 ± 4.24	29.39 ± 5.33	29.28 ± 5.36	3.922	0.173
Trait Anxiety	27.15 ± 6.67	26.74 ± 5.55	24.82 ± 4.62	5.457	0.038
Academic Performance	8.43 ± 1.83	7.94 ± 2.27	7.73 ± 2.37	6.676	0.008

5. Discussion

The current study set out to investigate the connections between schoolchildren's academic achievement and their levels of physical activity, cardiovascular health, and body composition. Partially supporting

the underlying theory, children who performed better academically showed a lower BMI than students who performed worse. Students' lower scores for academic achievement, anxiety, cardiovascular health, and physical activity worsened as they grew older, despite an increase in BMI ratings. This validated our theory regarding the additional objective.

The BMI values of the children in the present review were in line with being overweight or stout, as defined by World Health Organization development recommendations. This is because normal weight is defined as percentiles 5 to 85%, yet their percentiles were greater than 85. There were notable variations in BMIs between the academically performing and non-performing groups.

Additionally, there was a substantial negative correlation between academic performance and BMI, which is in line with other studies. Prior research, which indicated that students with higher BMI scores also had weaker working memory—a function that is connected to worse academic performance—confirmed these findings. In addition to demonstrating worse inhibitory control and reduced productivity in compromise, these students also performed worse on reading, arithmetic, and science assessments. The activation of brain neurotrophic factor (BDNF) could be involved in these variations in learning. It impacts local dynamic performance, controls the foundation of neuronal circuits, modulates the hippocampus's synaptic pliancy, and contributes to long-term memory. Lower levels of BDNF have been associated with less successful academic outcomes in children and young people who are overweight. In any case, ongoing research raises the possibility that additional studies are need to properly prove the link between obesity and subpar academic performance. Students in higher academic stages had higher BMI values; this could be explained by the fact that these students engaged in essentially less physical activity on a weekly basis and by the normal developmental process associated with those ages. Significant differences in BMI were also found in relation to the understudy's grade.

There were no discernible variations in anxiety levels between the groups with higher and lower academic achievement. There were found to be notable variations in quality anxiety according to the understudy's age. In line with the late experiment, younger students showed higher quality anxiety values than older students. This constant tendency to experience stress is shown by the characteristic scale, and as childhood anxiety is typically limitless in maturity and frequently related with specific psychopathologies, it may be a good indicator of an uneasy tendency in adulthood. Additionally, the current review discovered a negative association between students' academic performance and typical anxiousness, which is consistent with past examination results. Previous research has found a negative correlation between students' test-taking performance and quality uneasiness in students with low working memory limits and a positive correlation between students' test-taking performance and high working memory limits. This has raised concerns about the potential effects of tension on academic

performance. This finding highlights a global issue in medicine: a rise in patients who experience anxiety, particularly in their early years, calls for the use of expert interventions. Previous studies have shown that deep breathing, positive perception, and muscular relaxation are all part of a biofeedback relaxing preparation program that is used to reduce stress in children and improve their academic performance. Students who participated in these programs saw improvements in their academic performance and a decrease in anxiety.

Between the group with higher academic performance and the group with lower academic performance, there were no discernible variations in activity. In addition, students' levels of physical activity were low compared to the recommendations of groups that improve wellbeing for children and teenagers, which called for at least 60 minutes a day of moderate to vigorous physical activity. Additionally, the current study showed that there is a negative relationship between academic success and physical activity. These findings were in line with earlier assessments, which showed that kids with higher health levels were better at handling semantics and were able to build more complex lexical-semantic frameworks, which helped them recognize syntactic muddles faster. Furthermore, it facilitates their enhanced language and comprehension abilities, their capacity to discern the connection and relevance in scientific problems, and their enhanced capacity to exercise attentional control when taking on more difficult tasks by lowering superfluous brain activity. A number of the explanations for this link have been briefly described in the writing. Enhancing cardiorespiratory health has been shown to improve mental structure and function by influencing brain substrates and promoting the maturation of concentration and memory processes. Furthermore, prior research indicated that cortical vasculature and neuronal thickness synapsis may be elevated in cardiorespiratory health. Additionally, youngsters may be better positioned to advance if they learn to be watchful and physically prepare. Furthermore, it was revealed how BDNF interacts with cardiorespiratory health, which was also recently linked to better academic attainment. The group with better academic achievement and the group with lower academic performance did not significantly differ from one another, according to HR. Finally, it was found that HR essentially decreased with age, in accordance with controlling values and earlier tests, where pulses were recorded in children between the ages of 4 and 6 at 100 beats per minute (bpm), in children between the ages of 6 and 8 at 100 bpm, and in children between the ages of 8 and 12 at 86 and 94 bpm, which is consistent with a typical development of the autonomic sensory system.

5.1. Practical Applications

Physical activity is an essential component of children's and young adults' development since their minds are still developing and play a vital role in their overall development. Children's engines and cognitive designs are still growing in the early stages of life;thus it is also helpful in advancing their cognitive and neuromotor abilities. Given this, it could help them succeed academically. It is imperative

to put in place programs that incorporate parental and community mediations, as well as the intervention of children's parental figures, in light of the obesity pandemic that is adversely affecting children and young people. To improve the children's general wellbeing status, as well as their cognitive capacities, academic performance, mental profiles, and motor development, these programs should also link to sound propensities, such as upgrades for physical activity and nutritional designs.

6. Conclusion

Overall, this analysis has shed light on the complex relationship that exists between a student's body composition, cognitive abilities, and academic achievement. Our findings reveal that several aspects of body composition, such as age, level, weight, BMI, and pulse, collectively influence cognitive function throughout multiple developmental stages. Significantly, increased physical activity levels have a discernible impact on cognitive function. Moreover, different anxiousness levels—both in terms of quality and state—exhibited varied effects on cognitive performance. Notably, these cognitive alterations correspond with comparisons of changes in academic achievement, highlighting the fundamental relationship between physical health and academic success. This study emphasizes the importance of overall understudy prosperity and suggests that interventions aimed at reducing stress and optimizing body composition may improve cognitive performance and ultimately improve academic outcomes. As educators and parents continue to make strides toward comprehensive student growth, these findings serve as a valuable resource for appropriate practices that promote physical health and cognitive abilities in the pursuit of academic excellence.

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