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Original Article

Distribution, Water Soluble ions, Monitoring of Indoor Particulate Matter PM_{10}, $PM_{10-2.5}$, CO and CO_2 during Burning of Dhoop Samples

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Abstract *- Incenses, mosquitoes, dhoop, and other indoor combustion sources are frequently employed for aesthetic and religious purposes in a variety of indoor and outdoor contexts. Due to particulate matter exposure from inhaling the smoke produced by the combustion, there is a risk to one's health (PM). Monitoring of PM (PM_{10}, $PM_{2.5}$, and PM_1) levels during the preparation, lighting, and extinguishing of incense (agarbatti and dhoop) and the use of a mosquito coil in an enclosed space. The amount of carbon dioxide and carbon monoxide in the exhaust and how indoor pollution affects their health.*

Keywords *- Droop, PM_{10}, Inorganic ions, Source apportionment.*

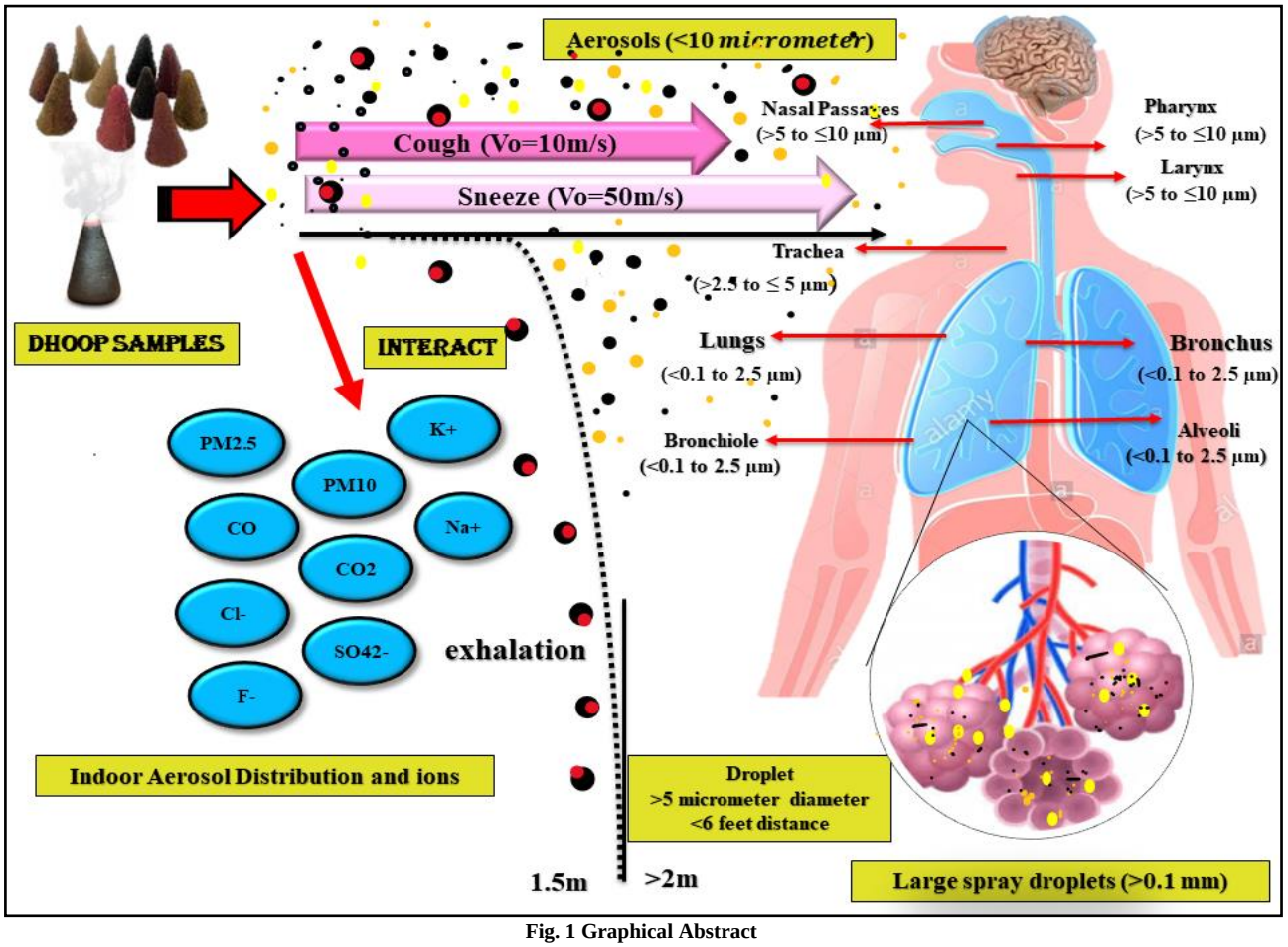

Fig. 1 Graphical Abstract

Size-segregation and distribution of organic aerosol in different Industrial areas of Raipur region

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Abstract: Organic aerosol contributes a significant fraction of particulate matters PM which is responsible for the various cardiovascular and respiratory diseases in urban environments globally. In the present study, we have discussed the comparative studies of composition, sources and distribution of organics ambient aerosols of various sugars primary saccharides (glucose, sucrose, trehalose, and fructose,) and sugar alcohols (mannitol and arabitol), together with laevoglucose, have been studied in ambient aerosols compounds are associated to PM_{10} in the various Industrial area (IA) of the most polluted city of central India, Raipur are discussed. The mean concentration levels of the organic aerosols (OA) in 07 locations of Raipur city such as Siltara, Urla, Hirapur, Bhanpuri, Mandir Hasod, Bhilai Steel Plant and Gudhiyari andthe concentration varies of Sugar, Lignin, Fatty acid, Sterols, Fatty Alcohol, PAHs, Phthalate esters and n- alkane ranged from 37-890, 6-121, 356-1467, 40-1437, 51-436, 1-18, 1490-2847 and 13-475 ng m^{-3} with mean value (p = 0.05) of 188±287,27±42, 279±427, 328±502,85±131, 4±6, 314±480 and 109±167 ng m^{-3} respectively during Dec 2019. The concentration of organic aerosols in the industrial area was >2 fold higher than in the city samples. The toxicity, composition and sources of organic aerosols are illustrated.

Keywords: PM_{10}, Industrial pollution, Sources apportionment, Organic, Ambient aerosols

Introduction

Aerosols can be introduced into the atmosphere either directly (primary aerosols) or formed from gas-phase precursors in the atmosphere (secondary aerosols). They scatter solar radiation either directly or by acting as CCN thus tending to balance the warming effect of greenhouse gases (IPCC, 2001). They also uptake numerous gaseous compounds in the atmosphere and provide the appropriate surfaces for heterogeneous chemical reactions thus altering the chemical composition of the particulate phase (Ravishankara,1997). The sources of aerosols as well as the processes they undergo affect their size distribution. Natural occurring particles (e.g. dust, sea salt) or aerosol products from physical mechanisms (e.g. rock grinding, seawater droplet formation) mostly produce relatively large particles. On the other hand, anthropogenic particles especially near their sources are normally fine (e.g. combustion processes biomass burning and fossil fuel combustion). The Mediterranean, neighboring extended deserts in the south (e.g. Sahara) and industrialized areas of Europe in the north, is one of the areas heavily affected by aerosols. Indeed, PM10 measurements performed at various places both in the westand the eastern basin of the Mediterranean report a significant number of exceedances of the limits from the proposed legislation (Rodriguez et al. 2001; Querol et al. 2004; Andreae et al. 2002; Gerasopoulus et al. 2006). Natural mechanisms such as dust transport can significantly influence (up to 80%) the levels of measured PM10 (Viana et al. 2002). Under such circumstances, the utilization of PM10 for decreased systems is exceptionally sketchy. Increased air pollution has recently become a major health concern in the developing countries of Asia (Singh et al. 2004; Ramchandran et al. 2007). Several studies demonstrated that atmospheric particulate matter (PM) has an impact on climate, biogeochemical cycling in ecosystems, visibility, and human health (Broecker et al.2000; Rinanldi et al. 2007; Tsai et al. 2004; Vega et al. 2010; Kendall et al. 2011; Fuentes, 2009). More specifically, air pollution appears to have an adverse effect on respiratory and cardiovascular systems, which might result in an acute reduction of lung function, aggravation of asthma, increased rate of pneumonia in the elderly and high death rates in new-born (Nastoset al. 2010; Wilson et al. 2004). Because of PM's ability to enter the body via the respiratory tract,

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Determination of carbon monoxide (CO) concentration and emission from various traffic vehicles of Raipur region

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Abstract
The increase of traffic flow in cities causes traffic congestion and accidents as well as air pollution. Traffic problems have attracted the interest of many researchers from the perspective of theory and engineering. In order to provide a simple and practical method for measuring the exhaust emission and assessing the effect of pollution control, a model is based on the relationship between traffic flow and vehicle exhaust emission under a certain level of road capacity constraints. In the proposed model, the hydrocarbons (HC), carbon monoxide (CO), and nitrogen oxides (NO) are considered as the indexes of total exhaust emission, and the speed is used as an intermediate variable. To verify the rationality and practicality of the model, a case study for Beijing, China, is provided in which the effects of taxi fare regulation and the specific vehicle emission reduction policy are analyzed.

Keywords: health effects, carbon monoxide, traffic vehicles

Introduction
Carbon monoxide (CO) is a tasteless, odorless and colorless gas. It is a by-product of partial combustion of organic compounds [1]. Although general fires, charcoal stove emissions, LPG fueled portable heater emissions account for the majority of reported CO poisoning fatalities, with about one third of CO poisoning cases resulting in death stem from gasoline motor exhaust emissions. [2] These cases are often associated with malfunctioning or clogged motor vehicle exhaust systems but also, to a lesser extent, with CO induced suicide attempts. In addition, tobacco products consumption is considered a significant source of CO poisoning in humans. The negative impact of urban road traffic is mainly on-air quality [3], ecosystem, and noise level [4]. Due to the continuing increase of motor vehicles, human health and environment have been severely impacted. According to the classification of air pollutant sources in urban area, motor vehicle emission accounts for more than 80% of the air pollution in major cities [5]. The statistics of Beijing show that the level of carbon monoxide and nitrogen oxides exceeds national standard even in the city's fourth and fifth ring roads where the average speed of vehicles is high. Since the concept of sustainable development has been adopted into the theory and methods of urban transport systems planning, the coordination between transportation development and urban environment becomes the focus of the urban transportation research in the 21st century. In recent years, many scholars have studied vehicle exhaust emission for environment protection [6-10]. The lethal consequences of CO in engine exhaust is tragically illustrated by the hundreds of persons who die each year from carbon monoxide poisoning caused by a running vehicle inside a closed garage. Others die or become ill in homes with attached garages, while stranded in their car, or while driving or riding in a vehicle with a defective exhaust system [11-14]. Motor vehicle emissions standards stated that all vehicles produced after the exploit of norms have to be compliant with the regulations. At present, Bharat Stage IV (BS IV) parallel to Euro IV regulations since April 1st, 2010 is applicable for various types of vehicles; India has recognized limits on CO exposures (at idle) for motorcycles, cars and innovative emission standards for gasoline-fueled cars took effective in 1991 [15]. The automobile emissions are affected by driving pattern; overcrowding, temperature, traffic speed, vehicle's engine conditions and emissions control equipment and its maintenance [16-20]. EPA and WHO has recommended exposure of ambient air quality guideline values for CO at 9 ppm and 25 ppm as an 8 h and 1 h time-weighted avg. concentration respectively. The exhaust pollutants regulations of CO emissions from various countries is represented in India as two wheelers as 0.5gm/km, Four wheelers (Petrol engine) 1.25 gm/km, Four wheelers (Diesel engine) 1.00 gm/km, Six wheelers (Petrol engine) 2.20 gm/km and Six Wheelers (Diesel engine) 2.20 gm/km. [21-25].

Materials and Methods
Study area
The traffic vehicular, emissions generate significant amounts of particulates in ambient air of Raipur city of India, causing climate, environmental and health impacts [26]. Raipur (21º23′ N, 81.63E) is a capital of

Assessment of industrial noise pollution in the Raipur region

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Abstract

A study of noise characteristics in some selected industrial area in Raipur region has been carried out. The study involves physical measurement of the noise levels using digital sound level meter and a social survey was conducted using questionnaire. Also, those living in the vicinity of the sawmill factories are particularly at high risk of excess noise exposure. Proper regulation should be put in place by both State and Local Governments and Industries should be located in designated non-residential area. Sound Intensity Modeling is been evaluated for all the industrial area and it is found that high Intensity of noise is found in all the area with various health issues. It is concluded that a risk of excess noise exposure exists among all the workers due to the very high noise levels found in this study.

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Original Article / Research Article

FLUORIDE CONTAMINATION IN ROOF DUST OF KORBA CITY

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Abstract
Korba is famous city in Chhattisgarh state in India due to its coal mining area. Coal is used for electricity generation and industrial fuel and has its important role in roof dust in Korba area. In this study total n=22 roof dust samples of this area were investigated with physico–chemical characteristics i.e., pH, electrical conductivity, and concentration F^-, Cl^-, SO_4^{2-} Na^+, K^+, NH_4^+etc, in the range 6.25-7.12, 182 - 544 µS/cm, 378 - 694 mg/kg, 150-250 mg/kg, 176.56-952.71 mg/kg, 30-349 mg/kg, 350-1875 mg/kg, 550-1250 mg/kg, 344-505 mg/kg, during March, 2015. The roof dust is very hard acidity. The concentration variation and source of fluoride and other ions in the roof dust were discussed toxicity of the contamination were discussed.

***Keywords**: Fluoride concentration; Cations/Anions distributions; Roof dust*

1. Introduction

Fluorine is one the most abundant element in nature. Being highly reactive, it is never found in its elemental gaseous form, but only in combined form [1]. About 96 percent of the fluoride in human body is found in bones and teeth. Fluorine is essential for the normal mineralization of bones and formation of dental enamel [2-5]. In early 30s, when fluorosis was first detected, fluoridated water was a problem in four states viz. Andhra Pradesh, Tamil Nadu, Uttar Pradesh, and Punjab. In 1986, when the technology mission on drinking water began its operation, fluorosis was found in 13 states in 1990 [6-8].

Korba is famous town in Chhattisgarh state in India due to coal mining area. Coal is used for electricity generation and industrial fuel in important role in roof dust in Korba area. Roof dust found in roof and ceiling houses and buildings near busy road, contaminated area and industrial area and dense city, this is a generally contaminated with a variety of minerals (such as asbestos) which a dangerous to health. The fluoride concentrations with some main physical and chemical concentrations were determined in this study are described. Fluorides concentrations are found very high in all samples that are may be affects their environments and create extreme conditions for health [9-11].

2. Experimental

2.1 Study area

The Korba area is selected for roof dust studies and located of the Chhattisgarh state, this area selected for the investigation of Fluoride (F^-) and other ions in roof dust. It is situated in near Hasdo River. **Figure 1** Korba basi ,CG, India (22˚21'0"N and 82˚40'48"E) It is a power capital of Chhattisgarh state, India. The basin is composed off blocks :Kartala, Katghora, Korba and Pali with population of ≈ 1 million distributed over 710 cities, towns and villages. Atleast 12 open and underground coal mines are in operation with annual production of ≈3 BT coal by discharging>100BT/Yr liquid effluents in the environment. In addition, the Asia biggest Aluminum Plant (BALCO) is running in the Korba basin.

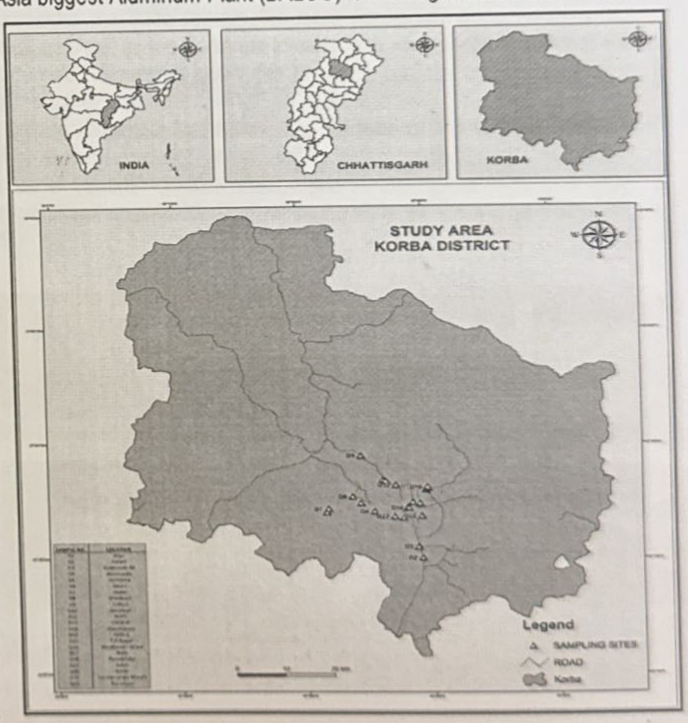

Fig 1: Representation of the sampling location of the Korba district.

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Original Article / Research Article

CHARACTERIZATION OF FLUORIDE IN DIFFERENT MOSQUITO COIL ASH SAMPLES

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Abstract
In Indian households, mosquito coils are fumed to repel mosquitos. To destroy mosquitos, they are blended with compounds such as fluoride, nitrate, and sulphate salts, among others. Some components persist in the bottom ash remnants after fuming. The ash particles are in micro particulate forms, posing respiratory risks. The components F^-, Cl^-, SO_4^{2-}, NH_4^+, Na^+, and K^+ in ash samples (n=10) from various sources are characterized in this paper. Physicochemical parameters such as pH, F^-, Na^+, K^+, Cl^-, NH_4^+, and SO_4^{2-} were measured. The pH values obtained ranged from 10.61 to 13.27. The EC value was achieved in the 527-6650 range. The concentration of F^-, Na^+, K^+, Cl^-, NH_4^+, SO_4^{2-} were obtained in the range of 70-2825, 125-3050, 4300-4975, 108-438, 1563-2083 and 750-10500 mg/kg with mean value 1230±774, 2123±382, 4798±130, 214±66, 1919±94, and 5233±2254, respectively. Therefore, the concentration of various ingredients and their sources are presented in the present work.
Keywords: *Characterization, Fluoride, Mosquito Coil, Aerosol*

1. Introduction

Mosquito coils are pesticides that are often used to defend against mosquitoes due to their harmful effects on mosquito populations. These impacts on mosquitos may increase the development of metabolic enzymes in exposed populations as a protective mechanism. Cytochrome P450 family 4 (CYP4) enzymes are metabolic enzymes involved in a variety of biological functions, including pesticide resistance. The efficacy of three commercial mosquito coils containing various pyrethroid active components was evaluated in this work, and their ability to promote the expression of CYP4 genes in Aedes albopictus was tested using real-time quantitative PCR [1-2]. Mosquito coils, vaporizer mats, and emanators provide protection against mosquito bites by the spatial effect of emitted vapour or airborne pyrethroid particles. Because these treatments dominate the pest management industry, it is critical to characterize mosquito reactions generated by chemical actives and their potential for disease prevention. [3-12]. Mosquito coil is well recognized as an effective mosquito repellent. Pyrethrins are the main active components in mosquito coils, accounting for around 0.3-0.4% of coil mass [12-19].The current study was undertaken to determine the elements present in mosquito coil and its ash using instrumental analysis on Inductively Coupled Plasma-Optical Emission Spectrometer (ICP-OES) to find out trace elements such as Lead, Cadmium, Arsenic, Mercury, Nickel, Chromium, Tin, and Antimony[20]. Mosquito coils, which are extensively used as home insecticides in Asia, contain varying quantities of octachlorodipropyl ether (S-2) as a synergist or active component. Because bis (chloromethyl) ether (BCME) is an extremely strong lung carcinogen that can be formed by the thermolytic destruction of S-2, contact with mosquito coils is likely to expose persons to a certain quantity of BCME, increasing the risk of lung cancer [21-25].

2. Materials & Methods

Mosquito coils are built of insecticide-impregnated biomass base materials. High performance liquid chromatography was used to detect the presence of aliphatic aldehydes and allethrin in the smoke generated by two kinds of mosquito coils. It was discovered that burning a mosquito coil creates more formaldehyde, acetaldehyde, and acrolein in the gaseous phase, but less particulate-bounded aldehydes. However, aldehydes bound in particles were enriched in terms of concentration. Allethrin was discovered to exist solely in particles ranging in size from 0.1 to 1.0 micron. The findings suggest that allethrin may not be efficient in killing mosquitos [7]. Mosquito coils of various varieties were found in the Raipur region. In this experiment, specific kinds of mosquito coils were employed (**Figure 1**).

Fig 1: Representation of the various mosquito coils samples.

2.1 Sample Collection

The 10 different mosquito coils of different brands were purchased from the local market of Raipur area. The physical properties of

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Assessment of Fluoride Level in the Groundwater of Dongargaon City

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The basic bed rocks of central India are contaminated with fluorite minerals. The overuse ofgroundwater for irrigation causes increased mineralization of F^- in the groundwater. This contaminatedgroundwater is widely used for drinking and other household purposes. The prevalence of fluorosis is mainly due to the intake of large quantities of fluoride through water. In this work, the fluoride pollution in groundwater of Dongargaon area (20.97°N and 80.85°E) during pre summer period (i.e. March 2020) is described. The concentration of F^- in the groundwater (n = 14) was ranged from 3.6–11.6mg l^{-1} with mean value of 8±1.1 mg l^{-1}.The quality of groundwater of Dongargaon block, Rajnandgaon, Chhattisgarh, India is examined. The physiochemicalproperty of groundwater is discussed.

Keyword : groundwater, fluorosis , mineralization, fluoride pollution, contaminated water.

Introduction

The weathering of the minerals (viz. topaz, fluorite, fluorapatite, villuamite, cryolite, ferro magnesium silicate, etc.), hydrological conditions and anthropogenic activities (viz. mining, coal burning, etc.) were reported for mineralization of excessive concentration of F^- in the groundwater [1-4]. Serious pollution of ground water has occurred in several regions of the country either due to leaching of contaminants from the land surface or/and abstraction from the bed rocks.The F^- contamination in groundwater of several states of the country viz. Andhra Pradesh, Assam, Bihar, Chhattisgarh, Gujarat, Haryana, Jharkhand, Jammu and Kashmir, Karnataka, Kerala, Madhya Pradesh, Maharashtra, Orissa, Punjab, Rajasthan, Sikkim, Tamil Nadu, Uttar Pradesh, Uttrakhand, West Bengal, etc. were reported [5-20].

Fluorine is a highly reactive element, and it has an important role in precipitation of various elements as minerals. Fluorine contents in the soil vary between 10 - 150 mg/kg, and the majority of fluorine occurs naturallyin combined forms in various rocks, soils, waters, plants, other living organisms, slag, fluxes, etc. The fluoridein the ground water is severely extracting from the bed rock causing a disease known as "fluorosis", which continuesto be an endemic problem in most parts of the world. Fluoride toxicity is characterized by a variety of signs and symptoms.Upon ingestion, fluoride binds calcium ions and may lead to hypocalcaemia. Fluoride has cytotoxic effects and interferes with a number of enzyme systems. Fluoride inhibits acetylcholinesterase, which may be partly responsible for hyper salivation, vomiting, and diarrhea[21]. Abnormal levels of fluoride in the groundwater is common in India due to weathering of thefractured hard rock pegmatite veins composing of minerals i.e. topaz, fluorite fluorapatite,villuamite, cryolite, ferro magnesium silicate, etc. Millions of people are exposed toexcessive amount of F^- through drinking water contaminated from natural (geogenic) andanthropogenic sources by suffering with various types of fluorosis disease.Severe gastroenteritis, salivation, restlessness, sweating, anorexia, muscle weakness, stiffness, dyspnoea, ventricular tachycardia, and colonic convulsions followed by depression and death are typically seen. Chronic fluorosis is characterized by unthrifty animals with skeletal and dental abnormalities. Reduced feed and water intake accompanied by poor weight gain and milk production reflect dental lesions and impaired mastication. Mottled, chalky, pitted and stained enamel and uneven and

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Hydroxychloroquine or Chloroquine as accessible weapon to fight against COVID-19 pandemic

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Abstract: *No medications are at present affirmed for Coronavirus Disease-2019 (COVID-19), albeit some have been attempted. Taking into account late investigations and conversation on chloroquine (CQ) and hydroxychloroquine (HCQ), we intended to survey existing writing and important sites concerning these medications and COVID-19, antagonistic impacts identified with drugs, and related rules.The exact instrumental activities of CQ and HCQ against SARS-CoV-2 isn't seen, however, is likely multifactorial: Inhibition of SARS-CoV-2 viral passage by CQ utilizing impedance with the connection of the ganglioside-restricting space at the tip of the N-terminal area of the SARS-CoV-2 spike with the ACE-2 receptor and hindrance of pH-subordinate viral molecule endocytosis through the rise of endosomal pH by the powerless base CQ.In this review regarding viruses, for reasons presumably incompletely indistinguishable including alkalinization by CQ of the phagolysosome, a few investigations have demonstrated the adequacy of this atom, including against coronaviruses among which is the SARS-related coronavirus.CQ and HCQ have comparative properties and movement, yet the generally lower harmfulness profile with HCQ has driven most specialists to suggest HCQ over CQ while considering treatment of SARS-CoV-2 with one of these operators.*

Keywords: *COVID-19, chloroquine, hydroxychloroquine*

1. Introduction

The episode of COVID-19 brought about by the extreme intense respiratory disorder coronavirus 2 (SARS-CoV-2/2019-nCoV) represents a genuine danger to worldwide general wellbeing and nearby economies. According to information accessible on different sites for COVID-19 diseases around the world, the cases are expanding exponentially. Such immense quantities of tainted and dead individuals require a critical interest of compelling, accessible, and reasonable medications to control and reduce the plague. The World Health Organization (WHO) proclaimed the Coronavirus disease (COVID-19) a pandemic on March 11, 2020. Until now, there is an earnest requirement for compelling medications against SARS-CoV-2. CQ and HCQ have been appeared to repress SARS-CoV-2 in vitro, and HCQ appears to be more successful than CQ **[1,2].** CQ with the formula (N4-(7-Chloro-4-quinolinyl)-N1,N1-diethyl-1,4-pentanediamine) has some time to be utilized and to treat intestinal sickness and amebiasis. Be that as it may, Plasmodium falciparum created boundless protection from it. In the previous years, because of inconsistent usage of CQ in clinical practice, its creation and market flexibly were extraordinarily decreased, in any event in China. The pandemic COVID-19 has pushed the worldwide social insurance framework to an emergency and added up to a tremendous monetary weight. Various medications for prophylaxis against COVID-19 including CQ and HCQ have been attempted. CQ is a prescription with a long history as an enemy of an intestinal sickness operator. Late intrigue was produced for the potential utilization of CQ for people with COVID-19 dependent on in vitro information that showed wide antiviral properties, including action against SARS-CoV-2. This potential has not been borne out in creature preliminaries and current clinical information is missing in regards to the treatment of COVID-19 disease with CQ. CQ and HCQ share a comparative instrument of activity; however accessible in vitro information shows that HCQ has a fundamentally more prominent intensity against SARS-CoV-2 than CQ, in light of its essentially lower powerful focus (EC50) esteem contrasted and HCQ [**3-4**].

Over a billion Indians as of now remain at the incline of a monstrous increment in instances of COVID-19. The Indian Council of Medical Research, (ICMR) under the Ministry of Health and Family Welfare, has suggested the chemoprophylaxis with HCQ (400 mg twice on day 1, at that point 400 mg once per week from that point) for asymptomatic human services laborers treating patients with suspected or affirmed COVID-19, and for asymptomatic family unit contacts of affirmed cases **[5].** The archive expresses "its utilization in prophylaxis is gotten from accessible proof of advantage as treatment and bolstered by preclinical information". Albeit some in-vitro proof backings the antiviral action of HCQ and its antecedent CQ, there is no companion looked into a distribution that assesses either medicate for presentation prophylaxis of SARS-

