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Hydrophobia--The water that I dread!

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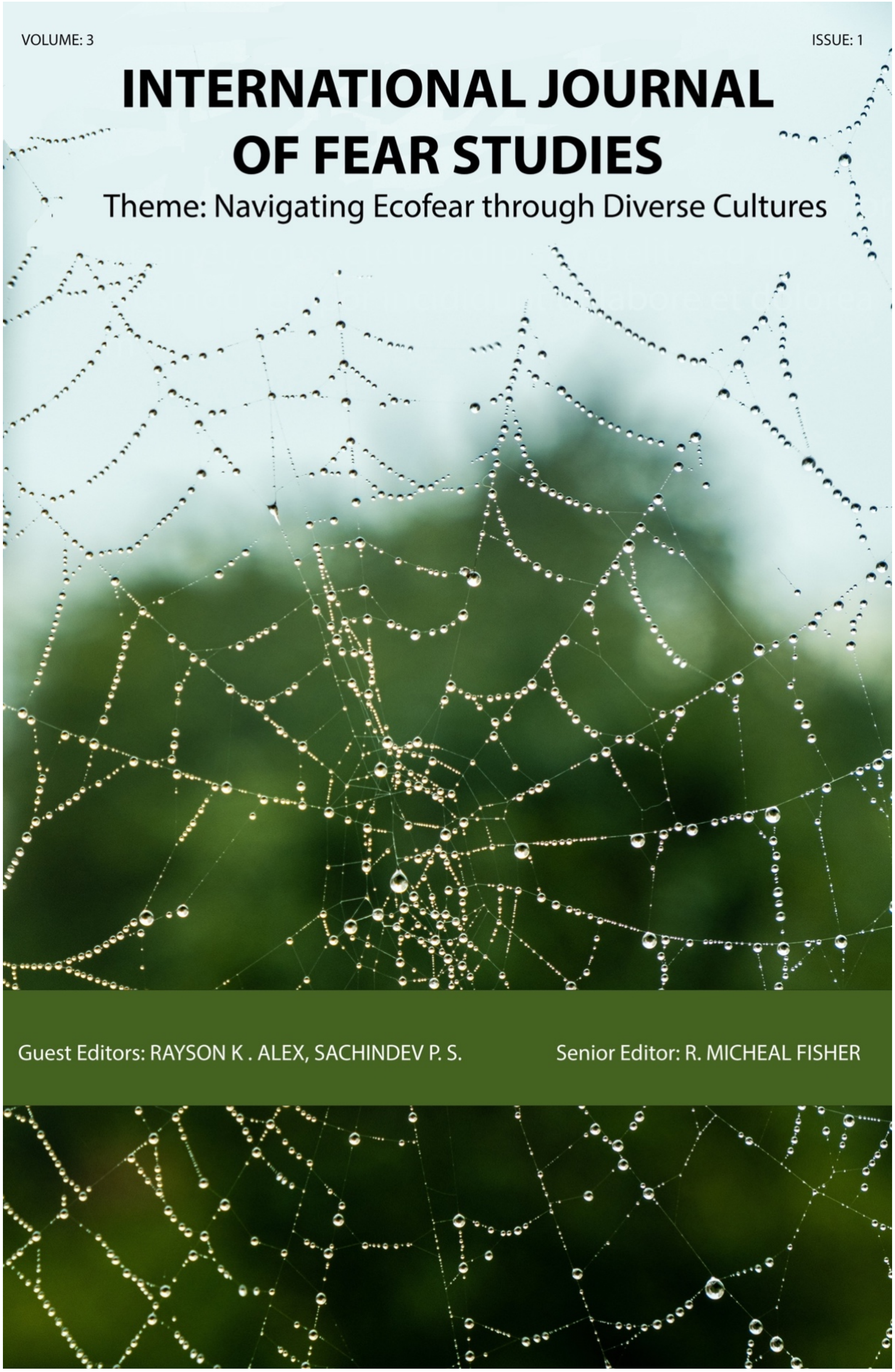

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B. CREATIVE WORKS

Experiential Fictional Stories

Hydrophobia—The Water That I Dread!

Deborah, S. Susan

In the rainy and stormy monsoon season of 2018, I found a home when I was barely 33 days old. It's a lovely memory if not for the monsoons which always evoke a sense of dread in me. It's monsoon now and though I enjoy my walks with my curly-haired mamma, I detest the puddles which appear and reappear in the course of our walks. My inherent child-like human seems to be fascinated with water and somehow forces me to either jump on the puddle or walk through it; my adult-self's nemesis! My human pappa who is also equally fond of water like my mamma takes special glee in threatening me with bathing every time he feels like it. Mean! I mean they know that our species has a certain disdain for water and overhearing the human read from her black box,(Laptop) that it is enough that I am bathed once a month. But my human parents don't pay any heed to that and bathe me or at least force-bathe me once a week!

My bath times are a blur. I am carried by force after trying to escape the clutches of my human (either man or woman). After all, where could I run, except round and round the drawing room which is no daunting task for my humans. But I must admit that I enjoy it when they carry me and I wish it was forever! But alas! The bathroom—cold and watery—drives me into a great dread! How I dislike water! Thankfully my humans use warm water which makes it bearable for me. Imagine cold water being poured over the body. I patiently await the bathing time to be over. But no! Shampoo once, then again and then scrubbing—prolonging the time of my misery. And in case it's my pappa, I have to wait until he bathes me with warm water. I wait for him to rub me with a dry towel which seems like forever. Fighting off my claustrophobia, I bide my time till the bathroom door opens. Once open, I run out of the bathroom into freedom and wriggle myself free of the water droplets. When my human parents took me to Kerala with them, there was a cage kept for the likes of me. I'm glad that I wasn't put into it. I think the bathing experience inside the closed bathroom doors would seem like that cage I had seen in Kerala. I'm happy that my parents don't lock me into that closed space. I would rather move about freely at home in Goa.

Autonomy is confined in the way I choose my position while sleeping but that comes with limitations as well—while I could choose my sleeping position, the place is not what I could possibly choose—I would love to snuggle in the bed along with my humans but alas, that is something I don't get too often and if I do get, I have to compromise on my position.

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Observations of surface water phytoplankton community in the Indian Ocean: A transect from tropics to polar latitudes

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ARTICLE INFO

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Diatom
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ABSTRACT

Phytoplankton, the primary producers in all aquatic systems, plays an important role in key biogeochemical processes that are linked to higher trophic levels and climate variability. The present study deals with the phytoplankton community structure in the Indian Ocean, particularly in the higher latitudes with respect to environmental variables to understand the region specific dominant community and its governing environmental settings. The study areas were selected along the latitudinal transect between 3°N and 53°S (northern Indian Ocean to Indian Ocean sector of Southern Ocean). The surface water phytoplankton community based on microscopy coupled with diagnostic pigment indices showed marked variation in community structure from tropical to polar latitudes of the Indian Ocean. The Prokaryotic diagnostic pigment ($Prok_{DP}$) dominated in the Equatorial and South Equatorial regions, the Flagellate diagnostic pigment ($Flag_{DP}$) in the North Equatorial region (NER), Southern Tropical Indian Ocean and Sub-tropical Front (STF) region whereas, the Diatom diagnostic pigment ($Diat_{DP}$) dominated only at the Polar Front (PF) region. The influence of a suite of environmental variables - temperature, nutrients, salinity and mixed layer depth (MLD), on the dominant phytoplankton groups at the STF and PF was observed. This understanding of community dominance from this poorly explored area with respect to influencing factors is very vital baseline information to design the perturbation experiments in future work to understand the phytoplankton process studies of each region.

1. Introduction

Phytoplankton, the major primary producers of aquatic bodies are responsible for almost 50% of the global net primary production (Field et al., 1998). Recent reports on global carbon budget indicate that, oceans currently absorb less atmospheric CO_2 compared to land (Le Quéré et al., 2018). Given current budgets reported in Friedlingstein et al. (2019) the ocean absorbs 2.5 Gt C yr^{-1} that is 23% of anthropogenic CO_2 emissions (11 Gt C yr^{-1}) whilst the land sink is 3.25 Gt C yr^{-1} or 29% of emissions. The relative contribution of land and ocean in drawing down anthropogenic atmospheric CO_2 may be debatable, but marine phytoplankton undoubtedly plays a critical role in the absorption of atmospheric CO_2 by the ocean. Phytoplankton communities consist of several groups (diatom, dinoflagellates, coccolithophores,.), their distribution, abundance and community structure are linked to higher trophic levels and key biogeochemical processes (Falkowski et al., 1998). Each group may have different ecophysiological and morphological traits, such as resource competitive abilities (Litchman and Klausmeier, 2001) and resource utilization strategies (Thingstad, 1998). Thus, understanding the mechanism that controls the biogeographic variation in phytoplankton community structure (Naik et al., 2015), is of global importance. Similarly, each oceanic region has a different potential to drawdown atmospheric CO_2 and in turn contribute significantly to the global climate (Sabine et al., 2004). The Southern Ocean is a significant sink for atmospheric CO_2 and effectively sways the earth climate and biogeography (Russell et al., 2006; Frölicher et al., 2015). Studies also indicate that the poleward shift and intensification of mid-latitude westerly winds increase the dominance of the Southern

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Surface Inorganic Iodine Speciation in the Indian and Southern Oceans From 12°N to 70°S

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Marine iodine speciation has emerged as a potential tracer of primary productivity, sedimentary inputs, and ocean oxygenation. The reaction of iodide with ozone at the sea surface has also been identified as the largest deposition sink for tropospheric ozone and the dominant source of iodine to the atmosphere. Accurate incorporation of these processes into atmospheric models requires improved understanding of iodide concentrations at the air-sea interface. Observations of sea surface iodide are relatively sparse and are particularly lacking in the Indian Ocean basin. Here we examine 127 new sea surface (≤10 m depth) iodide and iodate observations made during three cruises in the Indian Ocean and the Indian sector of the Southern Ocean. The observations span latitudes from ∼12°N to ∼70°S, and include three distinct hydrographic regimes: the South Indian subtropical gyre, the Southern Ocean and the northern Indian Ocean including the southern Bay of Bengal. Concentrations and spatial distribution of sea surface iodide follow the same general trends as in other ocean basins, with iodide concentrations tending to decrease with increasing latitude (and decreasing sea surface temperature). However, the gradient of this relationship was steeper in subtropical waters of the Indian Ocean than in the Atlantic or Pacific, suggesting that it might not be accurately represented by widely used parameterizations based on sea surface temperature. This difference in gradients between basins may arise from differences in phytoplankton community composition and/or iodide production rates. Iodide concentrations in the tropical northern Indian Ocean were higher and more variable than elsewhere. Two extremely high iodide concentrations (1241 and 949 nM) were encountered in the Bay of Bengal and are thought to be associated with sedimentary inputs under low oxygen conditions. Excluding these outliers, sea surface iodide concentrations ranged from 20 to 250 nM, with a median of 61 nM. Controls on sea surface iodide concentrations in the Indian Ocean were investigated using a

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Winter water variability in the Indian Ocean sector of Southern Ocean during austral summer

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ARTICLE INFO

Keywords:
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ABSTRACT

Winter Water (WW) is a feature in the upper layers of the Southern Ocean during austral summer. The interaction of this cold water with surface and deeper subsurface layers can alter the heat budget as well as the carbon cycle. However, the structure and characteristics of the WW in the Southern Ocean is poorly understood due to the lack of *in-situ* data. In this study, hydrographic data collected from the Indian expeditions during 2010 and 2011 and from other expeditions during 2003, 2006 and 2007 in the Southern Ocean have been utilized to understand the WW variability and its characteristics in the region between 40°E and 90°E. The analysis shows large zonal variations in the distribution of WW during austral summer. East of 60°E, the WW shows warmer temperature with weaker gradients than the western side, which is observed to have a larger meridional extension. The high frequency of eddies, surface warming and upwelling of the Upper Circumpolar Deep Water due to shallow bathymetric features of the Kerguelen Plateau situated in the eastern side of the study region is proposed as the major mechanisms for this variability. The direct impact of Southern Annular Mode on WW variability is investigated and a short term response is observed.

1. Introduction

The Southern Ocean (SO) is one of the most dynamic oceans in the world, and plays a major role in the global climate system. It is also a significant sink for heat and CO_2 and a site for the production of deep and intermediate water masses, which is one of the dominant driving forces for the global overturning circulation (e.g. Tamsitt et al., 2016; Frölicher et al., 2015; Marshall and Speer, 2012). The general circulation of the SO is dominated by the eastward flow of the Antarctic Circumpolar Current (ACC), which is the major conduit for inter-ocean transport of heat and freshwater fluxes (Rintoul and England, 2002; Williams, 2011). The Kerguelen Plateau is one of the major topographic features impacting the flow of ACC in the SO. It has been associated with the splitting of ACC (Rosso et al., 2015), mixing waters from different sources (Llort et al., 2018; Tamsitt et al., 2017) and is identified as one of the hotspots of eddy kinetic energy in the SO (Tamsitt et al., 2017). In a high nutrient-low chlorophyll region like the SO, these dynamics have profound implications for phytoplankton growth and biogeochemical systems (Siegelman et al., 2019). The SO comprises of several quasi-zonal frontal systems such as the Agulhas Front (AF), Subtropical Front (STF), Subantaractic front (SAF) and Polar Front (PF) (Orsi et al., 1995; Belkin and Gordon, 1996). The Antarctic Zone (AZ), which lies between the PF and the Southern Boundary of the Antarctic Circumpolar Current Front (SB), is characterized by cold winter water in the upper ~150 m water column during the winter and is overlain by fresher Antarctic Surface Water (AASW) during summer (Orsi et al., 1995).

The extreme seasonal cycles experienced in the SO results in the contrasting thermohaline structures changing from deep winter mixed layer to very shallow summer mixed layers (SML). At the beginning of the austral summer, the SML develops and gradually deepens leading to the generation of the subsurface temperature minimum layer (Toole, 1981). This temperature minimum layer acts as a physical vertical barrier to mixing in the upper layers south of PF during summer. It is the Winter Water (WW) which is the remnant of previous winter mixed layer capped by seasonal warming and freshening (Park et al., 1998), and with the warmer Circumpolar Deep Water (CDW) below (Toole, 1981). In

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Estimation of reactive inorganic iodine fluxes in the Indian and Southern Ocean marine boundary layer

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Abstract. Iodine chemistry has noteworthy impacts on the oxidising capacity of the marine boundary layer (MBL) through the depletion of ozone (O_3) and changes to HO_x (OH/HO_2) and NO_x (NO/NO_2) ratios. Hitherto, studies have shown that the reaction of atmospheric O_3 with surface seawater iodide (I^-) contributes to the flux of iodine species into the MBL mainly as hypoiodous acid (HOI) and molecular iodine (I_2). Here, we present the first concomitant observations of iodine oxide (IO), O_3 in the gas phase, and sea surface iodide concentrations. The results from three field campaigns in the Indian Ocean and the Southern Ocean during 2015–2017 are used to compute reactive iodine fluxes in the MBL. Observations of atmospheric IO by multi-axis differential optical absorption spectroscopy (MAX-DOAS) show active iodine chemistry in this environment, with IO values up to 1 pptv (parts per trillion by volume) below latitudes of 40° S. In order to compute the sea-to-air iodine flux supporting this chemistry, we compare previously established global sea surface iodide parameterisations with new region-specific parameterisations based on the new iodide observations. This study shows that regional changes in salinity and sea surface temperature play a role in surface seawater iodide estimation. Sea–air fluxes of HOI and I_2, calculated from the atmospheric ozone and seawater iodide concentrations (observed and predicted), failed to adequately explain the detected IO in this region. This discrepancy highlights the need to measure direct fluxes of inorganic and organic iodine species in the marine environment. Amongst other potential drivers of reactive iodine chemistry investigated, chlorophyll *a* showed a significant correlation with atmospheric IO ($R = 0.7$ above the 99 % significance level) to the north of the polar front. This correlation might be indicative of a biogenic control on iodine sources in this region.

1 Introduction

Iodine chemistry in the troposphere has gained interest over the last 4 decades after it was first discovered to cause depletion of tropospheric ozone (O_3) (Chameides and Davis, 1980; Jenkin et al., 1985) and cause changes to the atmospheric oxidation capacity (Davis et al., 1996; Read et al., 2008). Iodine studies in the remote open ocean are important considering its role in tropospheric ozone destruction (Allan

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Meridional variations in N^* and Si^* along 57°30′E and 47°E transects in the indian sector of the Southern Ocean during austral summer 2011

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ABSTRACT

The variations in nutrient utilization in the euphotic layer was studied using geochemical tracers N^* (NO_3^- $-16PO_4^{3-}$) and Si^* ($Si(OH)_4 - NO_3^-$) along two transect 57°30′E (T1) and 47°E (T2) during austral summer 2011 in the Indian Ocean sector of the Southern Ocean. Seawater samples collected from 8 depths within the euphotic zone (upper 200 m) along two meridional transects were analysed for nitrate, nitrite, silicate, phosphate and chlorophyll *a* (chl *a*). Clear meridional differences in nutrient limitation were observed along the two transects. Depletion of silicate at Antarctic Zone (AZ) stations was 1.6 times higher in T1 than in T2. Significant inverse correlations were observed for N^* ($p < 0.0001$) and Si^* ($p < 0.001$) values with temperature and salinity implying that redistribution of preformed nutrients was influenced by hydrography. However, significant variances in Si^* ($p < 0.001$ at SSTF and $p < 0.01$ at PF-2) along the two transects could be attributed to differential uptake of silica by phytoplankton. Low Si^* values were obtained at Polar Front 1 (PF1) and South Subtropical Front (SSTF) along T1 and from Sub Antarctic Front (SAF) to Polar Frontal Zone (PFZ) along T2. Although hydrography did have inverse correlation with tracers, the observed values indicate high consumption of silicate. Relatively higher Si^* values in the north of SSTF coincided with lower abundance of diatoms in these waters. Conversely, high Si^* values and abundance of diatoms at Antarctic Zone (AZ) indicate less consumption of Si. The biological consumption of nitrate was more clearly discerned in the northern region where nitrogen strongly limits the productivity both along T1 (39°S and the Agulhas Retroflection Front (ARF)) and T2 (40°S). Our observations suggest that much of the tracer distribution in these waters can be explained by the dominant phytoplankton groups, but influence of other biotic components on nutrient tracer distribution cannot be ruled out.

1. Introduction

The distribution of nutrients within the euphotic zone of global oceans is one of the significant factors determining the distribution of oceanic life (Falkowski et al., 1998). Marine phytoplankton strongly influence oceanic distribution and cycling of nutrients and vice versa (Morel and Price, 2003) within the photic depths. The amount of nutrients required by marine phytoplankton varies due to (i) phylogenetic differences between species and larger taxonomic groups (Quigg et al., 2003) and (ii) phenotypic variability between populations of the same species in response to different physical or chemical environments (Finkel et al., 2006). The nutrient stoichiometry of macronutrients in the photic layer influences the amount of carbon sequestered and transported into the deep ocean (Broecker, 1982). The similarity between the average N/P ratio of plankton biomass and spatial variations of dissolved nitrate and phosphate implied that a relatively constant number of N atoms per atom of P are assimilated by phytoplankton throughout the surface ocean and released by the respiration of organic matter at greater depths (Anderson and Sarmiento, 1994). The canonical Redfield's N:P:Si ratio of 16:1:16 in phytoplankton has been instrumental in our understanding of ocean biogeochemical cycles. However, marked variability in N/P and Si/N ratios observed by several researchers (Hutchins and Bruland, 1998; Morrison et al., 1998; Klausmeier et al., 2004; Timmermans et al., 2004; Giddy et al., 2012; Martiny et al., 2013) indicates an imbalance between nutrient supply and uptake. To explain the observed differences between nutrient uptake and stoichiometry, two geochemical tracers, namely N^* (NO_3^-- $16PO_4^{3-}$) and Si^* ($Si(OH)_4 - NO_3^-$), were introduced as important indicators of nutrient status related to the requirement of phytoplankton (Sarmiento et al., 2004). Since the changes in N^* and Si^* are completely controlled by

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Original article

A Qualitative inquiry into the Coping strategies of Goan adolescents living with parents having alcohol dependence

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Abstract

Background: Research on the effects of alcoholism on the family confirms the negative impact of parental alcohol abuse on the offspring. Yet, some develop as confident and emotionally strong individuals despite adversities. This study focuses on the shift from detrimental outcomes to positive coping abilities of adolescents.

Aim: To explore the coping strategies of Goan adolescents living with an alcohol dependent parent as a reflection of their perceptions.

Method: Adolescents studying in undergraduate colleges living with an alcohol dependent parent (N =15, Male = 4, Female=11, ages17-19 years) participated in the study.

Results: Four major themes were identified, following the thematic analyses of the data: seeking support, engaging in problem-solving behavior, practicing self-improvement techniques, and adapting to changes in perception.

Conclusion: Adolescents displayed different coping strategies resulting from their experience with the parent having alcohol dependence, which are a product of their characteristics, the family environment, the available social and emotional support, and the interaction between

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An Analysis Of The Factors Affecting The Indian Rupee Volatility

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Abstract-Exchange rates connects the domestic and the international markets for goods and services. It signals competitiveness of a country's exchange power with the rest of the worlds in a global market. It has the potential to have an impact on the economic welfare of the nation. The study of exchange rate and its relationship with different variables gained considerable importance in the last few decades. It becomes an important issue for professionals and researchers mostly for developing countries. From 1972 many developing countries bought a shift in their exchange rate policy from a fixed system to a floating exchange rate regime as a measure to control exchange rate volatility. This study would help in a thorough understanding of the sources of fluctuations of the exchange rate which is essential to design a more effective macroeconomic policy. This paper gives a brief view of the Indian Rupee in terms of fluctuations in the Indian Rupee against various currencies such USD, EURO, Japanese Yen and Pound, Foreign exchange reserve, and foreign exchange market turnover in India. The paper tries to analyze the factors affecting the Indian rupee volatility. Monthly data from April 2013 to March 2020 has been used for the study. From the graphical and trend analysis it is found that rising crude oil prices, increasing current account deficit, decreasing interest rates, increasing withdrawals by Foreign Institutional Investors, decrease in Foreign Direct Investments and decreasing Gross Domestic Product growth rates have contributed to the depreciation of the rupee against the US Dollar.

Keywords: *Exchange Rate, Macroeconomic Factors, Indian Rupee Volatility, Indian Economy*

I. Introduction

The increasing number of Covid-19 cases globally continues to wreak havoc in the global markets. The measures taken to control the pandemic Covid-19 has led to economic impacts of national lockdowns, travel restrictions, rampant unemployment, slack in demand for consumer goods, and sharply reduced business activity, have bought the currencies under tremendous pressure which could lead to recession in some countries. The exchange rate is an important aspect for importers, exporters, businesses, financial institutions, foreign exchange investors, and policymakers of a country. The exchange rate volatility is an unpredictable movement of exchange rates leading to either to a loss or gain in the foreign exchange market. Currency volatility will affect the value of foreign reserves,