*ejpmr, 2024, 11(12), 628-630*

**SJIF Impact Factor 7.065**

**EUROPEAN JOURNAL OF PHARMACEUTICAL AND MEDICAL RESEARCH**

www.ejpmr.com

Review Article

ISSN 2394-3211

EJPMR

# CYCLONE MOCHA 2023: A GEOPHYSICAL DISASTER THROUGH REVOLVING HURRICANE

**[1]*Dr. Dhaval Patel and [2]Dr. Dhrubo Jyoti Sen**

[[1]Jamp India Pharmaceutical Pvt Ltd, Office No. A - 1207, 12th Floor, Navratna Corporate Park, Ambli Bopal Road, Ambli, Ahmedabad, Gujarat-380058, India.]

[2]School of Pharmacy, Techno India University, Salt Lake City, Sector-V, EM: 4/1, Kolkata-700091, West Bengal, India.

***Corresponding Author: Dr. Dhaval Patel**

Jamp India Pharmaceutical Pvt Ltd, Office No. A - 1207, 12th Floor, Navratna Corporate Park, Ambli Bopal Road, Ambli, Ahmedabad, Gujarat-380058, India.

**Article Received on 21/10/2024** **Article Revised on 11/11/2024** **Article Accepted on 01/12/2024**

**ABSTRACT**

Cyclone is a large revolving tropical storm caused by winds blowing around a central area of low atmospheric pressure. It is a tropical storm when the maximum sustained wind speed is more than 63 km/h. In India cyclones usually occur in the month of May-June and October-November. More cyclones tend to occur on the eastern side i.e., towards Bay of Bengal. The tropical cyclones are the phenomena of the weather where the circulating winds form over the sea due to the energy released by the evaporation and saturation of water over the sea. Cyclones are also known as hurricanes and tornadoes in the US while they are known as typhoons in China and Japan. These cyclones are responsible due to Warm temperature at sea surfaces, Coriolis force impact area that forms a low-pressure zone, atmospheric instability, increased humidity in the lower to middle levels of the troposphere, low vertical wind shear, etc. In India, the capital cyclone city is Sundarbans which is located in the south 24 Parganas.

**KEYWORDS:** Cyclone, typhoons, tornados, meteorology.

## INTRODUCTION

A storm is any disturbed state of the natural environment or the atmosphere of an astronomical body.[citation needed] It may be marked by significant disruptions to normal conditions such as strong wind, tornadoes, hail, thunder and lightning (a thunderstorm), heavy precipitation (snowstorm, rainstorm), heavy freezing rain (ice storm), strong winds (tropical cyclone, windstorm), wind transporting some substance through the atmosphere such as in a dust storm, among other forms of severe weather. In meteorology, a cyclone is a large air mass that rotates around a strong centre of low atmospheric pressure, counter clockwise in the Northern Hemisphere and clockwise in the Southern Hemisphere as viewed from above (opposite to an anticyclone).[1-3] Cyclones are characterized by inward-spiraling winds that rotate about a zone of low pressure. The largest low-pressure systems are polar vortices and extratropical cyclones of the largest scale (the synoptic scale). A tornado is a violently rotating column of air that is in contact with both the surface of the Earth and a cumulonimbus cloud or, in rare cases, the base of a cumulus cloud. It is often referred to as a twister, whirlwind or cyclone, tropical cyclone is a rapidly rotating storm system characterized by a low-pressure center, a closed low-level atmospheric circulation, strong winds, and a spiral arrangement of thunderstorms that produce heavy rain and squalls. Depending on its location and strength, a tropical cyclone is referred to by different names, including hurricane, typhoon, tropical storm, cyclonic storm, tropical depression, or simply cyclone. A hurricane is a strong tropical cyclone that occurs in the Atlantic Ocean or northeastern Pacific Ocean, and a typhoon occurs in the northwestern Pacific Ocean. In the Indian Ocean, South Pacific, or (rarely) South Atlantic, comparable storms are referred to as "tropical cyclones", and such storms in the Indian Ocean can also be called "severe cyclonic storms".

The word Cyclone is derived from the Greek word “cyklos” meaning the coils of a snake or circle. It was coined by Henry Paddington because the tropical storms in the Bay of Bengal and the Arabian Sea appear like coiled serpents of the sea. According to meteorology: a cyclone is the large air mass that rotates around the strong centre of the low atmospheric pressure.

**Figure 1: Cyclone.**

The motion of the wind in the cyclone of the northern hemisphere is counter-clockwise and clockwise in the southern hemisphere as viewed from above, i.e., from the outer space. Cyclones are characterized by inward-spiralling winds that rotate about a zone of low pressure. There are 4 types of these: i) Tropical cyclone ii) Extratropical cyclone iii) Mesocyclone iv) Polar cyclone.

**Figure 2: Tropical cyclone, Extratropical cyclone, Mesocyclone and Polar cyclone.**

Who is called cyclone Man? Dr. M. Mohapatra, who is affectionately known as 'cyclone man of India' for having accurately predicted the path of ferocious cyclonic storm Phailin that hit the coast of Orissa in 1999.

**Figure 3: Formation of Mocha Cyclone**.

Weather Forecasting Department: Indian Meteorological Department. The Department of Meterology in India established in the year 1875. It is the National Meteorological Service of the country and the principal government agency in all matters relating to meteorology and allied subjects. Operational meteorologists, also known as forecasters: Collect weather data in some country, but it is mostly done by technicians elsewhere. Analyze data and numerical weather prediction model outputs to prepare daily weather forecasts. Provide weather advice and guidance to private or governmental users. Regional Specialised Meteorological Centre (RSMC) at India Meteorological Department (IMD), New Delhi is involved in monitoring and prediction of Tropical Cyclones (TC) over the North Indian Ocean (NIO) basin comprising of the Bay of Bengal (BOB) and the Arabian Sea (AS). Director General of Meterology; Dr Mrutyunjay Mohapatra. He is regarded as the "cyclone man" There are five regional bodies for monitoring and predicting tropical cyclones over its respective region. The Regional Specialised Meteorological Centre (RSMC), Tropical Cyclones, New Delhi, gives a tropical cyclone formed over Indian Ocean an identification name from a given list. This department in India is responsible for naming the cyclones.

In the first week of the May, 2023, the Indian meteorology department has alerted the nation about the coming cyclone. It was predicted to form over the Bay of Bengal and it is predicted to hit the state of Odisha and West Bengal in the second week of May by 10th. [4-6]

Who is the father of weather forecasting in India? Noted Scientist Vasant Gowariker is known as the Father of the Indian Monsoon Model.

Mocha Cyclone: As per as the Indian Meterology Department [IMD], the reports for the cyclone on May 5th 2023, the Mocha cyclone will start to formulate over the sea on 6th May 2023 and will turn severe that will mark the landfall by 12th or 13th in the month of May. It is expected to affect many districts of Odisha and West Bengal.

The course of Mocha Cyclone: A cyclonic circulation is likely to develop over the southeast Bay of Bengal on Saturday, 6th May, 2023. Under its influence, a low-pressure area is likely to form over the same region on Sunday, 7th May, 2023. It is likely to intensify into a depression over the southeast Bay of Bengal on Monday 8th May, 2023, the weather office said.

Then the cyclone is expected to move towards the north-eastern part of the Bay of Bengal. Though, the Regional Meteorological Centre (RMC), Kolkata, is yet to confirm the course. As per as the international model for this cyclone is may move towards the heart of the Bay of Bengal. For such cases, it will change its course to Tamil Nadu by May 11th, 2023. It may occur that the landfall on the southeast coast of Bangladesh or in Myanmar. It is likely to make landfall as a very strong cyclone in Odisha and West Bengal.[7,8]

Which country gave the name mocha? The name is derived from the city of Mokha, Yemen, which was one of the centers of early coffee trade. Like latte, the name is commonly shortened to just mocha.

Who is the mother of meteorology? Anna Mani helped India become self-reliant in the field of meteorology. In 1948, she returned to India and joined the Indian Meteorological Department (IMD) at Pune.

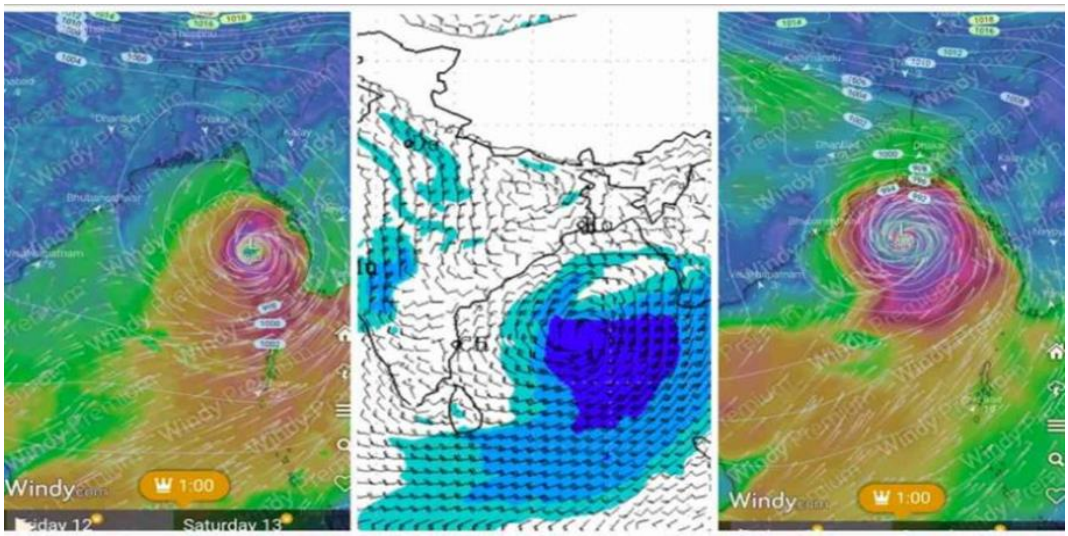


**Figure 4: The affecting areas by cyclone mocha.**

The Indian Meteorological Department warns of a cyclonic storm forming in the Bay of Bengal this weekend, putting several states including Tamil Nadu/Chennai, Odisha, West Bengal, and Andhra Pradesh on high alert. Disaster response teams are ready to act, and fishermen have been advised to stay away from the sea until 11th May.


**Figure 5: Cities under the alert of cyclone Mocha [till May 11th 2023].**

**Andhra Pradesh**: An orange alert was put out in the state. It is expected by the (IMD) that there will be a heavy rainfall which will be accompanied by thunder and lightning.

**Tamilnadu/Chennai**: there has been an alert given the state. Though the major rainfall and storm will be in the city and suburbs.[9,10]

**West Bengal**: All cyclone-prone districts in West Bengal have been put on alert. State Disaster Response Force (SDRF), National Disaster Response Force (NDRF) and others are in readiness for any possible eventuality. The fishermen and the boatswains are all ordered to return to the shore from May 8th to 11th.

**Odisha**: Due to the constant 4 years of the cyclones experienced by the state, Chief Minister Naveen Patnaik chaired a high-level review meeting after the (IMD) predicted a possible cyclone brewing in the Bay of Bengal.

## CONCLUSION

It is a large revolving tropical storm caused by the winds blowing around a central area of low atmospheric pressure. There are 4 basic types of cyclones- tropical, extratropical, polar and mesocyclone. The word cyclone is derived from a Greek word “cyklos”. Meterology is the study of science concerned with the processes and phenomena of the atmosphere, especially as a means of forecasting the weather. Indian Meteorological Department [IMD] is responsible for the weather forecasting used by the government and for the private usage purposes. In the first week May of 2023, (IMD) predicted the cyclone Mocha which will form over the southern part of the Bay of Bengal in the May 5th and will turn into a severe threat by the date of May 11th, 2023. The cities which are put to an alert are West Bengal, Odisha, Chennai, Tamil Nadu and Andhra Pradesh. Cyclone mocha will affect the life of the people and the economy of the society and people who are related to the marine life or the sea life. The lives and livelihoods of the residents are affected by saltwater ruining farms, freshwater fishes in ponds being killed, and flattened mud huts.

## REFERENCE

This work is based upon the following information gathered from the following websites:

1. Orlanski. "A rational subdivision of scales for atmospheric processes". Bulletin of the American Meteorological Society, 1975; 56(5): 527–530.
2. Evans, Clark; Wood et al, "The Extratropical Transition of Tropical Cyclones. Part I: Cyclone Evolution and Direct Impacts". Monthly Weather Review, 2017; 145(11): 4317–4344.
3. Rostami, Masoud; Zeitlin, Vladimir. "Influence of condensation and latent heat release upon barotropic and baroclinic instabilities of vortices in a rotating shallow water f-plane model" (PDF). Geophysical & Astrophysical Fluid Dynamics, 2017; 111(1): 1–31.
4. Rostami, Masoud; Zeitlin, Vladimir. "An improved moist-convective rotating shallow-water model and its application to instabilities of hurricane-like vortices" (PDF). Quarterly Journal of the Royal Meteorological Society, 2018; 144(714): 1450.
5. Raymond D. Menard; J.M. Fritsch. "A Mesoscale Convective Complex-Generated Inertially Stable Warm Core Vortex". Monthly Weather Review, 1989; 117(6): 1237–1261.
6. Shultz, James M.; Russell, Jill; Espinel, Zelde. "Epidemiology of Tropical Cyclones: The Dynamics of Disaster, Disease, and Development". Epidemiologic Reviews, 2005; 27: 21–35.
7. R. H. Simpson; Paul J. Hebert. "Atlantic Hurricane Season of 1972" (PDF). Monthly Weather Review, 1973; 101(4): 323.
8. James M. Shultz; Jill Russell; Zelde Espinel. "Epidemiology of Tropical Cyclones: The Dynamics of Disaster, Disease, and Development" (PDF). Epidemiologic Reviews, 2005; 27: 21–35. Garima, Khera. "A vortex of winds-Cyclones – Geography and You". Retrieved 14 January 2021.
9. Rui-Rong Chen; Don L. Boyer; Lijun Tao. "Laboratory Simulation of Atmospheric Motions in the Vicinity of Antarctica". Journal of the Atmospheric Sciences, 1993; 50(24): 4058–4079.
10. Deborah Hanley; John Molinari; Daniel Keyser. "A Composite Study of the Interactions between Tropical Cyclones and Upper-Tropospheric Troughs". Monthly Weather Review. American Meteorological Society, 2001; 129(10): 2570–84.