log on to thegoan.net @thegoanonline Facebook.com/thegoan The Goan E-Paper (Playstore/IOS) Instagram.com/thegoanonline

THE GOAN

EVERYDAY

SATURDAY JANUARY 3, 2026 13 pages | PRICE ₹ 10 PANAJI | MARGAO GOA | VOLUME XI, NO. 196 RNI: GOAENG/2015/65729

Study warns of heavy metals in fish off Caranzalem beach

SAYS REGULAR CONSUMPTION LIKELY TO POSE HEALTH RISK

SARDINES, MACKERELS AMONG THOSE IN CONTAMINATED LIST

SHWETA KAMAT MAHATME
THE GOAN I PANAJI

Regular consumption of fish caught off Caranzalem beach may pose potential health risks to humans due to elevated levels of heavy metals, a new scientific study by researchers from Goa University has warned.

The study has found that several commonly consumed fish species accumulate metals beyond permissible limits, raising concerns over long-term dietary exposure for coastal communities and seafood consumers in the State.

The findings suggest that prolonged intake of contaminated fish could lead to non-carcinogenic health effects, underscoring the need for closer monitoring of seafood safety along Goa's urban coastline.

The study 'Metal bioavailability in sediments and bioaccumulation in edible fishes from Caranzalem beach, Goa, India', undertaken by A M Patil, M R Nasnodkar and C J G Fernandes, focused on assessing metal bioavailability in sediments and quantifying metal concentrations in different fish organs -- muscles, gills, liver and kidney -- to evaluate toxicity implications for both marine life and humans.

One of the key findings of the study was the uneven distribution of metals within fish organs. The majority of the analysed fish species showed the highest accumulation of metals in the kidney, followed by the liver, gills and muscles. "This higher renal accumulation of metals compared to liver, gills and muscles was attributed to its physiological functions such as filtration, excretion and ion regulation," the study said.

The study found that concentrations of iron (Fe), manganese (Mn), zinc (Zn) and copper (Cu) in the muscles of 11 commonly consumed fish species, including Sardinella longiceps (Tarle) and Rastrelliger kanagurta (mackerel), exceeded standard permissible limits prescribed for human consumption.

Surface sediment samples collected from the intertidal zone showed that over 35 per cent of bioavailable manganese (Mn), zinc (Zn), copper (Cu), cobalt (Co) and nickel (Ni) were bound to sediment fractions capable of entering the marine food web. While Zn, Cu, Co and Ni were mainly associated with iron-manganese oxides and organic matter or sulphide fractions, manganese was predominantly bound to carbonate phases, making it relatively more mobile.

Risk analysis using the Risk Assessment Code (RAC) categorised Mn, Zn, Cu and Ni as posing medium to very high ecological risk, while Screening Quick Reference Table (SQUIRT) values indicated potential toxicity of manganese

›Continued on P5

TOXIC CATCH: KEY FINDINGS OF THE STUDY

- Several commonly consumed fish species found to accumulate metals beyond permissible limits
- Prolonged consumption of contaminated fish may lead to non-carcinogenic health effects
- Underscores need for stricter seafood safety monitoring
- Metal accumulation varied among fish organs, with the highest levels observed in kidneys, followed by liver, gills, and muscles
- High metal concentration in kidneys linked to role in filtration, excretion, and ion regulation
- Muscle tissues of 11 commonly consumed fish species showed iron, manganese, zinc, and copper concentrations exceeding permissible limits for human consumption
- Over 35% of metals were bound to fractions capable of entering the marine food web
- Risk assessments classified these metals as posing medium to very high ecological risk, with manganese showing potential toxicity to marine organisms

›Continued on P5

FROM PAGE 1 ››

Study warns of heavy metals in fish off Caranzalem beach

to marine organisms.

Human health risk assessment carried out as part of the study revealed worrying trends. The Target Hazard Quotient (THQ) was found to be greater than 1 for iron, indicating a potential non-carcinogenic health risk. Moreover, the Hazard Index (HI) exceeded 1 for all the studied fish species, suggesting a possible cumulative health risk from long-term consumption of contaminated fish. "Target Hazard Quotient (THQ) greater than 1 for Fe and Hazard Index (HI) greater than 1 for all species suggested a possibility of metal toxicity to humans upon consumption," it said.