

# Harpadon Nehereus: An Easily Accessible Yet Untapped Cardiac Remedy in West Bengal

UPASANA SEN<sup>1</sup>

<sup>1</sup>Sam Higginbottom Institute of Agriculture, Technology and Sciences

Allahabad, Uttar Pradesh 211007

\*\*\*\*\*

**Abstract** - Cardiovascular diseases have been one of the major health threats, which owe a great deal to the food habits and preferences of people in a region. Lack of awareness on health and diseases, poverty and other demographic shifts, and lifestyle changes influence those habits and preferences significantly. In this study, we try to review a nutrition source Harpadon nehereus, a marine fish in the context of this disease in the coastal region of West Bengal. We find that it has a high polyunsaturated fatty acid content (omega-3 content 53%) and quite abundant in the Bay of Bengal making them cheaper. Yet, this species of fish has remained underutilized by the people in this region, even though; high smoking and alcoholism rate makes this place more vulnerable. Fish is very dominant protein source in Bengali cuisine. With proper awareness about the nutritional benefits and affordability of this fish, it can integrate well in the local cuisine and help prevent the health hazard

**Key Words:** Cardiovascular, Harpandon nehereus, isobaths, polyunsaturated fatty acid

## 1. INTRODUCTION

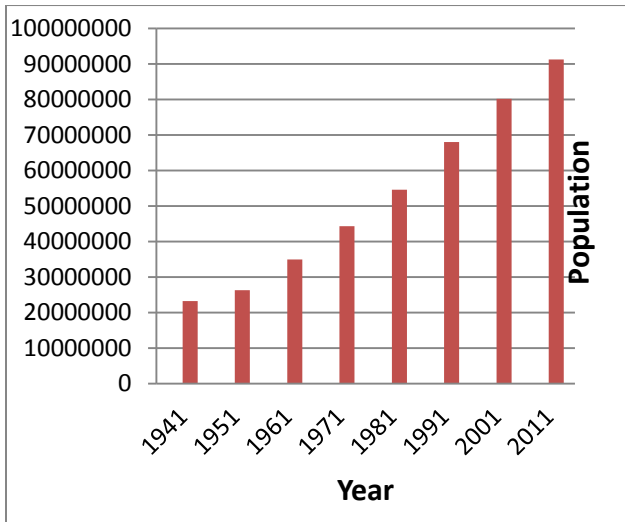
We can think of two types of indicators to determine the health status of a population viz. 'individual level markers' and 'community level markers'. Components like nutrition, access to safe drinking water and sanitation facilities, type of shelter and awareness about health and health care fall in the first type of individual level markers. These components are defined in terms of an average household in the community. The second type of markers - community level markers, comprise primarily of the mortality & morbidity rates, demographic shifts, per-capita income, quality of health services and effects of climate change among others. They can be defined as gross quantities of the population or community of interest. Any remedy to

fix a problem in population health has to be, therefore, through changes in the aforementioned markers. Coronary heart disease has risen from 1% in 1960 to 11% in 2003 and 14% in 2011 among India's urban population [1]. With the rising health problems of obesity, cardio-vascular diseases and others, in India, the state of West Bengal being no exception, one ought to look for solutions by studying those markers in local context [2]. One motivation to study West Bengal was that it has now emerged as the most densely populated state in India (Table 1) [3]. As Fig.1 indicates, the population of West Bengal practically doubled between 1971 and 2001.

**Table-1:** Population share and population density: 2001

	Percentage to total national population	Density of population (per Sq. Km.)
West Bengal	7.81	904
India	100	324

One such solution in the context of W.B., through nutrition, would be making the masses aware of the benefits of consuming a locally abundant resource - Bombay duck fish (*Harpadon nehereus*).



**Chart-1:** Population in west Bengal 1941-2011.

## 2. MATERIALS & METHODS

- We did a literature search for the period from 1978 through 2015 to identify all relevant studies of cardiovascular diseases, with reference to Bombay duck fish. Besides published research papers, sources like - text books, annual reports and other technical reports, in this context, have also been reviewed to formulate an understanding of the benefits of Bombay duck fish in preventing cardio-vascular diseases.
- We also referred to some demographic studies to understand the gravity of the problem of cardio-vascular diseases in this region.

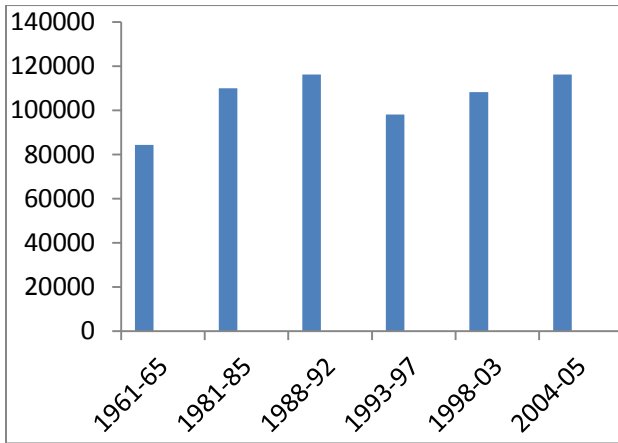
## 3. DISCUSSION

The literature review yielded several many corroborating statistics and facts about the grave alarming threats to population in the region from cardio-vascular diseases. It was found that in 2008, there were 1,61,564 cases of non-communicable disease (NCDs) in West Bengal, which included cardio-vascular diseases (hypertension and ischaemic heart disease), stroke, cancers, diabetes, chronic respiratory disorders, etc. Total number of deaths registered was 10,245 [4]. A recent study from West Bengal found that 20.5% of the patients with ischemic

heart disease were smokers. A cross-sectional survey of a random sample of the population aged  $\geq 40$  years old of Siliguri by North Bengal Medical College revealed that 11.6% had ischemic heart disease (IHD) and 47.2% had hypertension. A substantial proportion (22.99%) of individuals exhibited stage 1 (14.72%) and stage 2 (8.27%) hypertension and 39.69% were in pre-hypertensive category. Only 2.66% were on medication. About 30% of the women and 18% of the men in Kolkata are obese [5]. Another thread of literature review, with a problem solving spirit, revealed about a very abundant yet underutilized resource in that region, viz. *Harpadon nehereus*, commonly known as the ‘Bombay duck fish’. One of habitats is in the 50m to 70m isobath of the Bay of Bengal . They have two distinct fishing seasons (Table 2. shows protein content at various periods): 1) September – January, 2) February – March. They are very soft fish, although highly perishable because of high water content [6][7]. Most importantly, it has a very high content of total lipid (2.5%) and phospholipids (68%) which contain: Saturated Fatty



Acids (SFA): 27.73 %, Mono Unsaturated Fatty Acid (MUFA): 18.67 %, and **Poly Unsaturated Fatty Acid (PUFA): 53.55 %** [8]. The PUFA as the name suggests have unsaturated C-double bonds. Due to the double bond, the fatty acid chain has a bent. Thus, when they are present in the lipid bilayer cell membranes, they create gaps in them leading to a higher fluidity of the cell membrane. This aids the exchange of bio-molecules between cells and their surroundings, preventing any form of inflammation of the cells. One such inflammatory disease of the vascular systems is Atherosclerosis [9], which is prevented by PUFA.



**Chart-2:** Average annual landings of Bombay duck (Catch in ton)

**Table-2:** Protein percentage of Bombay duck at different storage period.

Storage period	% protein
Freshly dry fish	58.33
6 month storage sample	55.73
1 year storage sample	54.09
2 year storage sample	51.98

#### 4. CONCLUSIONS

Consuming proper amounts of the Bombay-duck fish can help reduce the risks of heart strokes. This is due to the substantial level of Omega 3 polyunsaturated fatty acids (commonly known as PUFA). They help prevent the buildup of cholesterol that can clog the arteries, leading to heart attacks and strokes. With its added advantage of being low cost, it makes an effective solution to cope with the rampant problems of cardio-vascular disease and obesity. We hope, these perks of eating Bombay-duck fish should be made known to masses, to see positive change in the region.

#### REFERENCES

- [1] The Times of India, Bangalore, the Times of India Heart Summit, Friday, August 2, 2013. P. 15.
- [2] Anonymous: West Bengal development report-2008 Planning commission, Government of India, New Delhi.
- [3] Statistical Abstract, West Bengal, 1978-79 (Combine Issue). Bureau of Applied Economics and Statistics.
- [4] <http://www.indushealthplus.com/west-bengal-health-statistics/>
- [5] Mandal S, Saha JB, Mandal SC, Bhattacharyya RN, Chakraborty M, Pal PP: Prevalence of ischemic heart disease among urban population of Siliguri, West Bengal; Indian Journal of Community Medicine 2009; 34(1):19-23.
- [6] ICAR:Handbook of fisheries and aquaculture (Eds. Ayyappan S, Jena JK, Gopalakrishnan A, Pandey AK), Directorate of Knowledge Management in Agriculture, ICAR, New Delhi, 2011.
- [7] Krishnayya C H: Age and growth of Harpodon nehereus and its fishery in the Hoogly estuarine system. Journal of Zoological Society of India. 1968; 20 (1 & 2): 129 - 147.
- [8] Bera R, Dhara T K, Bhadra R, Majumder GC and Sen P C: Ecosapentaenoic and docosahexaenoic acids enriched polyunsaturated fatty acids from the coastal marine fish of Bay of Bengal and their therapeutic value. Indian Journal of Experimental Biology. Vol. 48. December2010, pp. 1194-1203.
- [9] Ander, Bradley P., et al. "Polyunsaturated fatty acids and their effects on cardiovascular disease." *Experimental & Clinical Cardiology* 8.4 (2003): 164.