Vision for Smart Bangladesh: A study on ship collision avoidance algorithms

Zobair Ibn Awal[1]* and **Tasmim Hossain Samyo**[2]

[1]Department of Naval Architecture and Marine Engineering, Bangladesh University of Engineering and Technology, Bangladesh

[2]Bangabandhu Sheikh Mujibur Rahman Maritime University (BSMRMU), Bangladesh

*Corresponding author email: zobair@name.buet.ac.bd

The Smart Bangladesh Vision 2041 aims to transform Bangladesh from a densely populated country to an intelligent, developed, equitable, and high-income nation by 2041. This transformation is crucial for fostering digitally equipped citizens and addressing population growth. Bangladesh's shipping industry needs development in intelligent technologies like robotics, Artificial Intelligence, Big Data, Virtual Reality, the Internet of Things, and Autonomous Ships. The Perspective Plan for Smart Bangladesh raises the bar on improving river transport safety and developing smart riverport infrastructure. Automation technology can improve productivity and service efficiency to meet future traffic demand. Considering smart Bangladesh, movements in the inland water transportation system are expected to increase. So, for Bangladesh's economic growth, there must be a reduction in accidents in water transport. Many accidents occur due to ship collisions, and they must be avoided. Ship collision avoidance is crucial for building a Smart Infrastructure and fostering economic growth. This paper will investigate ship collision avoidance algorithms that can be applied to autonomous ships. Such techniques can also assist human operators to predict and avoid eminent ship collisions. Several algorithms are tested, and their performances are evaluated. Results suggest that ship collision is a complicated phenomenon involving both man and machine. Recommendations are made for future research.

Seasonal variation of semen quality among the three genotypes of native chicken

Md. Saiful Islam[1] and Shakila Faruque[2]*

[1]Department of Environmental Sciences, Jahangirnagar University

[2]Poultry Production Research Division, Bangladesh Livestock Research Institute (BLRI)

*Corresponding author email: shakila@blri.gov.bd

The study was conducted to determine the seasonal variation in semen quality of three types of native cocks. This study included 90 bird samples from three genotypes (Non-descript Deshi, Hilly, and Naked Neck). To analyze the color, volume, consistency, and transparency of semen in different seasons, 548 semen samples were obtained from 90 birds. Semen was collected using an abdominal message technique, and semen volume was measured using a tuberculin syringe. CASA software was used to determine microscopic physical and morphological features. The results revealed that a number of phenotypic parameters were statistically highly significant, and body circumference was statistically significant ($p > 0.05$). However, wattle width was determined to be insignificant. The properties of semen differ greatly depending on the season. Semen color, consistency, and transparency varied seasonally across three species of indigenous cocks. The maximum semen volume in this experiment was 0.318 ± 0.010 ml in the summer, while the lowest semen volume was 0.218 ± 0.008 ml in the spring. Besides, the semen volume of ND, HI and NN were highly significant, and the effect of seasonal and genotypic interaction on semen volume was non-significant. The sperm concentration was higher in NN compared to ND and HI. The percentage of static, bent tail, coiled tail, DMR, distal droplet, and proximal droplet were comparatively higher HI and NN genotype, the percentage of motile was higher in NN genotype. The outcomes of this study may be useful to poultry farmers in selecting native cocks for chicken breeding and artificial insemination (AI) throughout the year.