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Tracking the migration of Albatross butterflies (*Appias* sp) in Sri Lanka

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Abstract

In Sri Lanka, mass migrations of butterflies were recorded in the past, but they are now rare. Those large migrations and their definite direction of flight have not been observed during the past decades. It is unclear in most instances where the butterfly migrations in Sri Lanka begin and end. Therefore, here we report observations on the migrations of two butterflies, the lesser Albatross and common Albatross during the inter-monsoonal period from March to April 2023. Observations were made at 60 random locations to determine the starting point and the directions of migration. We observed a large group of butterflies swarming over Thalawakele and Kandy. Immediately, we began to gather information from 58 other locations. In every location, the direction of butterfly flight and the average number of butterflies passing the observation location per minute were recorded and ranked with colour codes. Rankings were: white = 1–20 butterflies, yellow = 21–30 butterflies, orange = 31–50 butterflies, and red = more than 50 butterflies. These rankings were marked on a map of Sri Lanka with arrowheads. Arrowheads are pointed in the observed direction of migration at the observation point. The flight speed of migrating butterflies was calculated by counting the time taken by 10 individual butterflies to pass 10 m at each observation location. After marking all observations, three major migratory directions were identified from southeast to northwest, east to west, and north to south. With all these observations, it is clear that most Albatross butterflies migrate towards the northwest of the country. This finding is different from the traditionally common understanding and previous records that these Albatross butterflies migrate towards Adam's Peak.

About the Journal

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Conference Proceedings

Synthesis of Reduced Graphene Oxide/$CaWO_4$ Composite Photoanode for Enhanced Activity towards Photoelectrochemical Water Splitting

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Abstract

Hydrogen is a clean, energy-efficient, and environmentally friendly fuel that holds promise for the future. Photoelectrochemical water splitting has attracted tremendous interest in low-cost clean hydrogen production. Researchers have started to develop potential photocatalysts to improve the efficiency of the water-splitting reaction. The scheelite oxides and their derivatives comprise a large family of promising semiconductor photocatalysts because of their structural simplicity and flexibility, good stability, and efficient photocatalytic performance. this study, scheelite calcium tungstate ($CaWO_4$) [coated on fluorine doped oxide (FTO)] and graphene oxide were synthesised using chemical bath deposition-calcination and Hummers' methods, respectively. Furthermore, prepared graphene oxide was deposited on $CaWO_4$ to form a rGO/$CaWO_4$ composite by electrophoretic deposition, which improved the photoelectrochemical performance of the CaWO4 photoelectrode. Electrode characterization was done by Fourier transform infrared spectroscopy, X-ray diffraction, Mott-Schottky analysis and UV-Visible spectroscopy. Photoelectrochemical oxidation of water was monitored in a standard three-electrode cell using a platinum counter electrode, and Ag/AgCl (3.33 mol L^{-1} KCl) reference electrode. The PEC activity of the films has been derived through linear sweep voltammetry under periodic chopped UV-Vis illumination of 35 mW cm^{-2} (using Xe-lamp) in 0.1 mol L^{-1} Na_2SO_4 (pH 7, PBS) within the potential range of 0 to 1.2 V at a scan rate of 10 mV s^{-1}. Under periodic UV-Vis irradiation for water oxidation, the composite material (rGO/$CaWO_4$) showed the highest photocurrent of 10 µA $cm^{-}2$, while $CaWO_4$ only showed 0.25 µA cm^{-2} when measure at 0.8 V. Photocurrent is increased as charge transfer resistance at the electrode surface decreases, allowing charge transfer reactions occur more easily. Furthermore, the photoelectrodes prepared demonstrate excellent stability for water splitting.

About the Conference

2nd International Conference on Frontiers in Chemical Technology

20 - 22 Jun 2024

Institute of Chemistry Ceylon, Sri Lanka

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Assessment of the Pre-Practice Hydration Status of National Athletes In Sri Lanka

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Abstract

In the context of competitive sports, athletes' physiological health has a significant impact on their best performance; hydration is essential, and it's critical to determine what aspects effect National athletes. The purpose of the study was to investigate the pre-practice hydration status of National athletes in Sri Lanka. Urine-specific gravity (USG) measurements and a fluid intake questionnaire were used to collect data for this cross-sectional descriptive study design. 89 national athletes from both team and individual sports which included Netball, Kabaddi, Baseball, Volleyball, Karate, Rugby, Basketball Football, Hockey, and Track and Field athletes were selected using the purposive sampling technique, and the sample size was determined through the Krejcie and Morgan Equation. The data was analyzed using descriptive statistics and Pearson's chi-square test. The results revealed that 51.69% of the athletes were significantly hypohydrated with a mean of USG of 1.036± 0.00245, 31.46% appeared hypohydrated with a mean of USG of 1.024 ± 0.001 and 16.85% of the athletes appeared euhydrated with a mean of USG of 1.0125 ± 0.01398. The observed frequencies of the hydration status categories are not equal to the expected frequencies (x^2 = 16.337, p> 0.05) suggesting potential disparities in the hydration status distribution. The study highlights the importance of tailored hydration strategies to optimize the health and performance of National level athletes in Sri Lanka.

About the Conference

1st International Conference on Sports & Physical Education (ICSPE - 2024)

04 Jun 2024

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The Effect of an Eight Week Training Programme to Develop Hand Eye Coordination and Balance of Under 16 Netball Players in Karagasthalawa Maha Vidyalaya

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Abstract

Netball is a popular sport played by two teams of seven players. It requires good attention, high goal-scoring ability and quick thinking. Sometimes, players are good at attack and defense but lack balance and often commit footwork errors, and some players with good balance struggle to focus on the ball. This study investigated the effects of an eight-week training program on hand-eye coordination and balance in under 16 netball players at Karagasthalawa Maha Vidyalaya. An experimental research design was utilized and the sample was chosen using the simple random sampling method. Six participants were assigned to either the treatment group (n=3) or the control group (n=3). The treatment group participated in an eight-week training program with three days training session per week to improve hand-eye coordination and balance. The control group did not participate in any specific training. The Alternative Hand Wall Toss Test (AHWTT) and Multiple Single Leg Hop Stabilization Test (MSLHST) were used in the study's pre-test and post-test assessments to evaluate the impact of an eight-week training program. Data analysis was conducted using Microsoft Office 2013 and IBM SPSS Statistics 26 software, employing a two-way mix ANOVA test. Results revealed significant improvements in the treatment group's performance. Notable enhancements were observed in the AHWTT (pre-test: 11, post-test: 24, $P < 0.05$), MSLHST - right (pre-test: 0.74, post test: 0.87, $P < 0.05$), and MSLHST - left (pre-test: 0.73, post-test: 0.87, $P < 0.05$) scores. Two way mixed ANOVA indicated significant differences between the treatment and control groups across the intervention period. The treatment group showed a significant improvement in AHWTT ($P=0.045$), MSLHST - right ($P=0.008$), and MSLHST - left ($P=0.018$) compared to the control group. In contrast, the control group exhibited minimal changes in both AHWTT and MSLHST scores. These findings indicate that the eight week training plan implemented in the study positively influenced the development of balance and hand eye coordination. These observations are important for optimizing training regimens aimed at enhancing athlete performance and motor skills.

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The Effect of Backward Drills on Speed and Agility of Netball Players of Sabaragamuwa University of Sri Lanka

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Abstract

Netball, a high-intensity sport, requires players to exhibit speed, agility, power, dynamic balance, and proprioception. Backward movement entails movement in the opposite direction and imposes greater demands on alternative sensory systems offering potential benefits to enhance forward movement merformance. The principal aim of this study was to find the effect of backward training program on agility and speed of Netball Players. The study design was truly experimental, comprising seven netball players from the Sabaragamuwa University team, aged between 23- 25, selected using a cluster sampling method. Five players were randomly assigned to the treatment group and two to the control group. Players were selected based on availability, inclusion and exclusion criteria, and their physical fitness. A limited number of plavers were included in the control group to maintain a baseline for comparison, while the primary focus observing the potential benefits of the intervention on a larger sample. The treatment group was on underwent a continuous 8-week training program, practicing 3 days per week, whereas the control group continued their regular training sessions. Speed was evaluated through the 20m and 35m sprint tests, while agility was assessed using the agility 505 test and agility T-test. Player performance was analyzed across pre-, mid-, and post-test sessions. Data was analyzed using SPSS, with ANOVA to investigate the impact of backward drills on the performance of netball players. The treatment group results showed significant improvements across all measured parameters. In the 20m sprint test, mean scores for the treatment and control groups were 3.44 and 5.01 seconds, respectively; in the 35m sprint test, 5.29 and 7.16 seconds; in the agility 505 test, 2.26 and 3.10 seconds; and in the agility T-test, 10.13 and 12.77 seconds. Significant improvements were noted in the 20m sprint ($p < 0.010$), 35m sprint ($p < 0.000$), agility 505 test ($p < 0.000$), and agility T-test ($p < 0.027$). Although coaches commonly integrated backward running exercises into team sports training, their true efficacy had been underexplored. These findings proposed that incorporating netball-specific exercises performed in reverse held significant potential for enhancing speed and agility, than solely focusing on traditional forward running drills.

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Research Grants

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Department	Natural Resources
Name of the grant	Competitive Research Grant - National Science Foundation
Grant winning project title	Evaluation of the effects of pesticides on non-target aquatic communities and ecological processes and to identify the response of aquatic microbes for pesticide contamination.
Grant amount	3.94 Million LKR