

**Acoustic repertoires related to surface behaviours of the Irrawaddy dolphins (*Orcaella brevirostris*) in Brunei Bay, Malaysia**

**ABSTRACT**

Behavioural observation and acoustic recordings of Irrawaddy dolphins (*Orcaella brevirostris*) were performed simultaneously in Brunei Bay, Malaysia. Surface behavioural observations were classified into four categories: travelling, foraging, socialising, and milling. A total of 8.43 hours of acoustic recordings were used to retrieve four different types of sounds: whistles, burst-pulsed sounds, click trains, and biphonal sounds. The recorded whistles were frequency-modulated sounds with durations ranging from 0.06 to 3.86 s and a mean minimum frequency of  $6.5 \pm 2.5$  kHz. The burst-pulsed frequency ranged from  $>48$  kHz in at least four variations. Click trains were made up of broadband clicks with variable inter-click intervals and frequencies  $>48$  kHz. The first biphonic sounds for Irrawaddy dolphins have been revealed in this study. Whistle rates were extremely high in milling. Compared to travelling and foraging, socialising had a significantly higher rate of click trains. Across all surface behaviours, there was no significant difference in burst-pulsed rates. This study laid the groundwork for ongoing monitoring of Irrawaddy dolphins and expanding conservation efforts for this species in Malaysia