## Behavioural Science

# Biphonation enhances the potential for individual recognition in the dhole *(Cuon alpinus)*

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Pack cohesion is very important for cooperative hunters such as dholes, and it is based, for the most part, on a repeated production of special calls. Our recent study showed that these calls may include a low-frequency pattern (f) or a high-frequency pattern (g), or simultaneous emission of both f and g components, resulting in a phenomenon termed biphonation. The f pattern is a product of focal fold oscillations, whereas there are at least four hypotheses about the g production mechanism. What is the communicative role of simultaneous emission of the f and g patterns in the dhole?

We have compared the value of the f and g components both separately and jointly for the correct assignment of biphonic calls to particular dhole individuals. We randomly selected, from tape recordings, 30 biphonic calls from each of 6 subadult dholes from two non-related litters and analysed them spectrographically on 22 time, frequency, and power parameters. We then used discriminant function analysis to identify individuality of the f and g components taken separately and f and g taken together as the whole of the biphonic calls. The analysis showed on average 70.6% of correct assignment for the f component (with nine parameters providing approximately equal impact on the discrimination) and 82.8% for the g component (primarily dependent on two parameters) and 95.6% for both components together. Our results suggest that the combination of the f and g components into a complex biphonic call substantially facilitates individual discrimination in the dhole.