

(e.g., Torres & Read, 2009). Although the authors of the present study have no doubt that sardines form a key component in the diet of bottlenose dolphins locally as derived from surface feeding events observed in the Gulf of Ambracia, we have no information on the prey during benthic foraging. Nevertheless, while fish scale sampling has some limitations in regards to the overall diet, the method serves as a useful tool for prey identification and is easily replicable in other areas where dolphins, or other piscivores, engage regularly in surface feeding behaviour.

In dietary studies of marine mammals, ecologists mostly use indirect methods to identify prey items (Bowen & Siniff, 1999), resulting in various important limitations. Under certain circumstances, the identification of scales lost by the prey represents a useful approach. Although gross morphological analysis of fish scales allows for the identification of prey genera and even species, our study revealed that reliable differentiation of closely related species can be problematic. Some clupeid genera, particularly *Sardina* and *Sardinops*, possess considerable plasticity in their scale characteristics (Patterson et al., 2002). Examination of scale ultrastructures (Khemiri et al., 2001; Esmaeili et al., 2007) or the application of landmark-based morphometric analysis (Ibáñez et al., 2007; González-Castro et al., 2012) are likely to help overcome the limitations of gross morphological analysis (Bräger et al., in press).

In addition to the species composition of a diet, the size of the prey items can be obtained via the back-calculation of fish lengths from scale samples (Carlander, 1982; Pierce et al., 1996). This extrapolation, however, requires a large number of reference scales with corresponding body lengths for individual fish to cover intraspecific variation. Moreover, with an appropriate sample size and evenly distributed year-round sampling, fish scale analysis has the potential to provide information about seasonal changes in diet composition.

Predation events on mixed-species fish schools may pose additional challenges given that species with deciduous scales may be overestimated compared to species with more adherent (or rapidly sinking) scales. Finally, although scale analysis conducted on stomach, pellet, and faecal samples can lead to successful prey identification (Mauchline & Gordon, 1984; Ewins et al., 1994; Cottrell et al., 1996, respectively).

In summary, fish scale analysis provides a non-invasive and easy method to collect large sample sizes for prey species identification. The obvious challenge is that it is only applicable to surface feeding events, and it introduces potential biases due to varying degrees of scale deciduousness (and/or density and sinking speed) among prey

species, thereby allowing semi-quantitative considerations. Furthermore, the method requires a reliable identification of the predator, which may pose a serious challenge considering that predators other than dolphins may also be targeting a given fish school.

Nonetheless, the frequent and almost exclusive occurrence of sardine scales in samples collected during this study convincingly show that two sardine species—*Sardina pilchardus* and *Sardinella aurita*—represent the main prey of the bottlenose dolphins during surface feeding bouts. With the accessibility of comprehensive reference catalogues for fish scales (e.g., Patterson et al., 2002; Bräger & Moritz, in press), prey identification via fish scale analysis can be a fast, non-invasive, and cost-effective method in dietary studies of marine and freshwater piscivorous species.

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