

Daily ration and feeding chronology of dominant diel vertical migrant fishes in the Subtropical Eastern North Atlantic Ocean.

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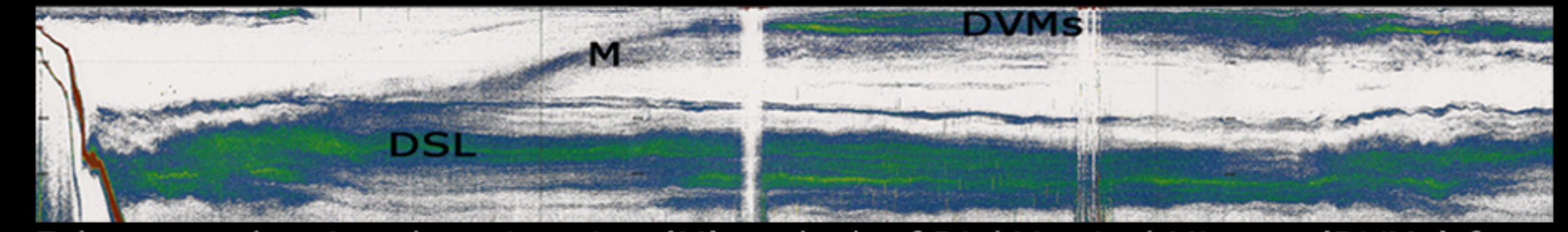


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Introduction.

Diel vertical migrants (DVMs) are mainly zooplankton and micronekton which migrate upward from 400-500 m depth every night to feed on the productive epipelagic zone, coming back at dawn to the mesopelagic zone, where they defecate, excrete, and respire the ingested carbon (Hidaka *et al.*, 2001). DVMs should contribute to the biological pump in the ocean and, accordingly, to the global CO₂ balance. The lanternfishes (myctophidae) usually contribute up to 80% of total DVMs biomass. Myctophids may, thus, represent a pathway accounting for a substantial export of organic carbon to the deep ocean. However, the magnitude of this transport is still poorly known.

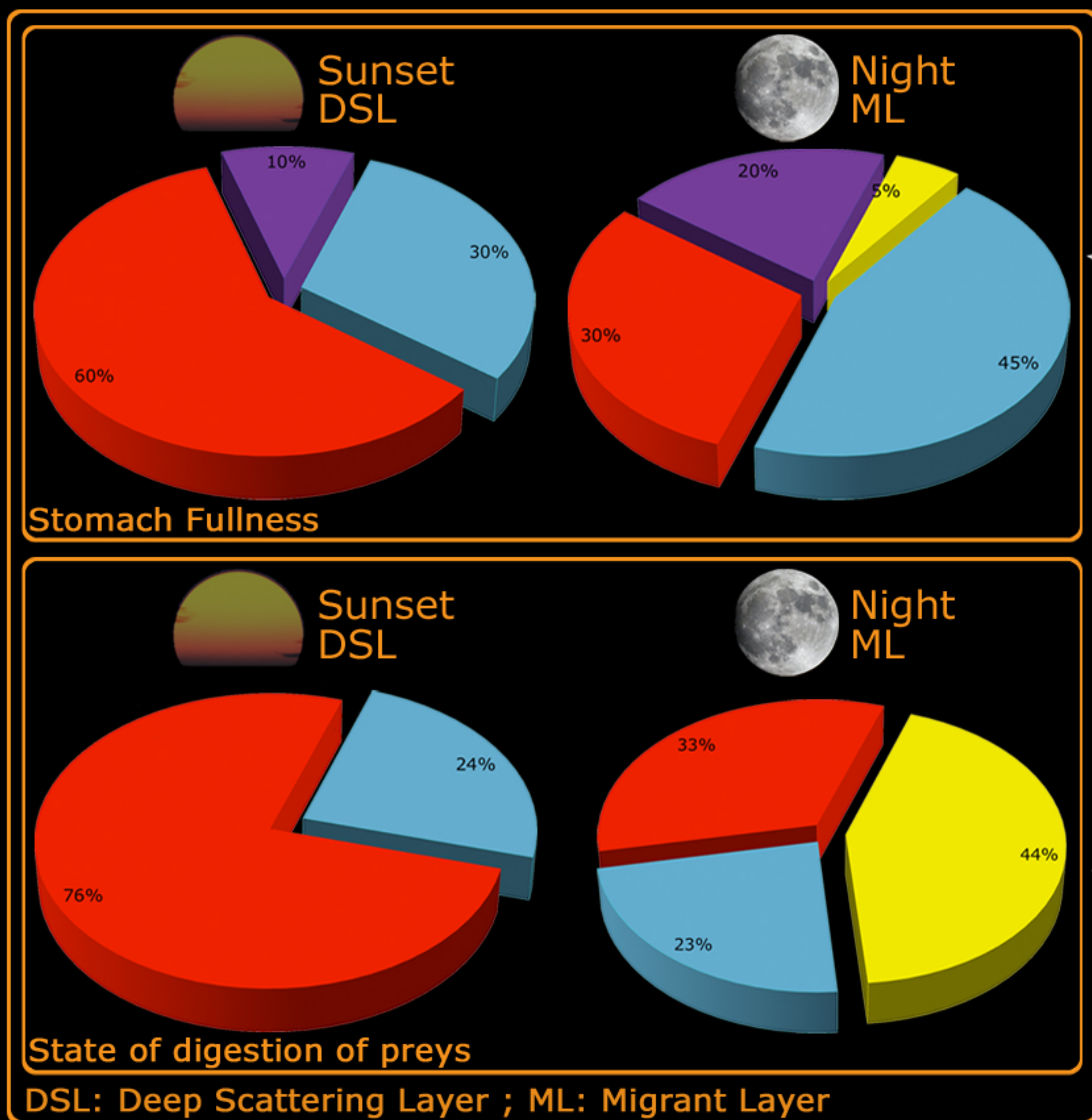
In order to assess this active flux of carbon, we performed a preliminary study of mesopelagic organisms around the Canary Islands. Here we present the results of diet, daily rations and feeding chronology of *Lobianchia dofleini* and *Hygophum hygomii*, two dominant species of myctophids performing diel vertical migrations in the Subtropical Eastern North Atlantic Ocean.



Echogram showing the migration (M) at dusk of Diel Vertical Migrants (DVMs) from the Deep Scattering Layer (DSL) to shallower waters. Courtesy of F. Bordes.

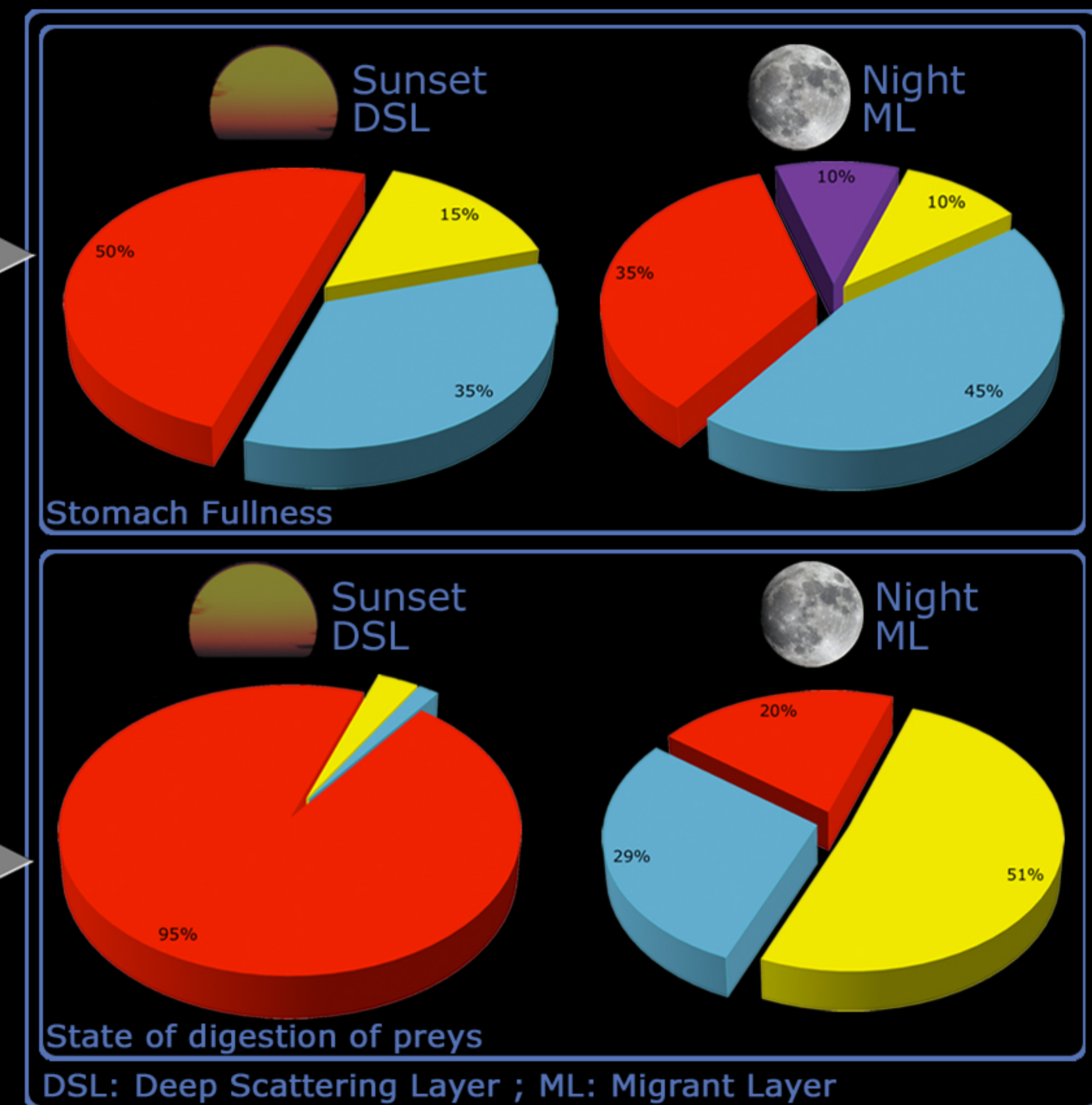


Lobianchia dofleini

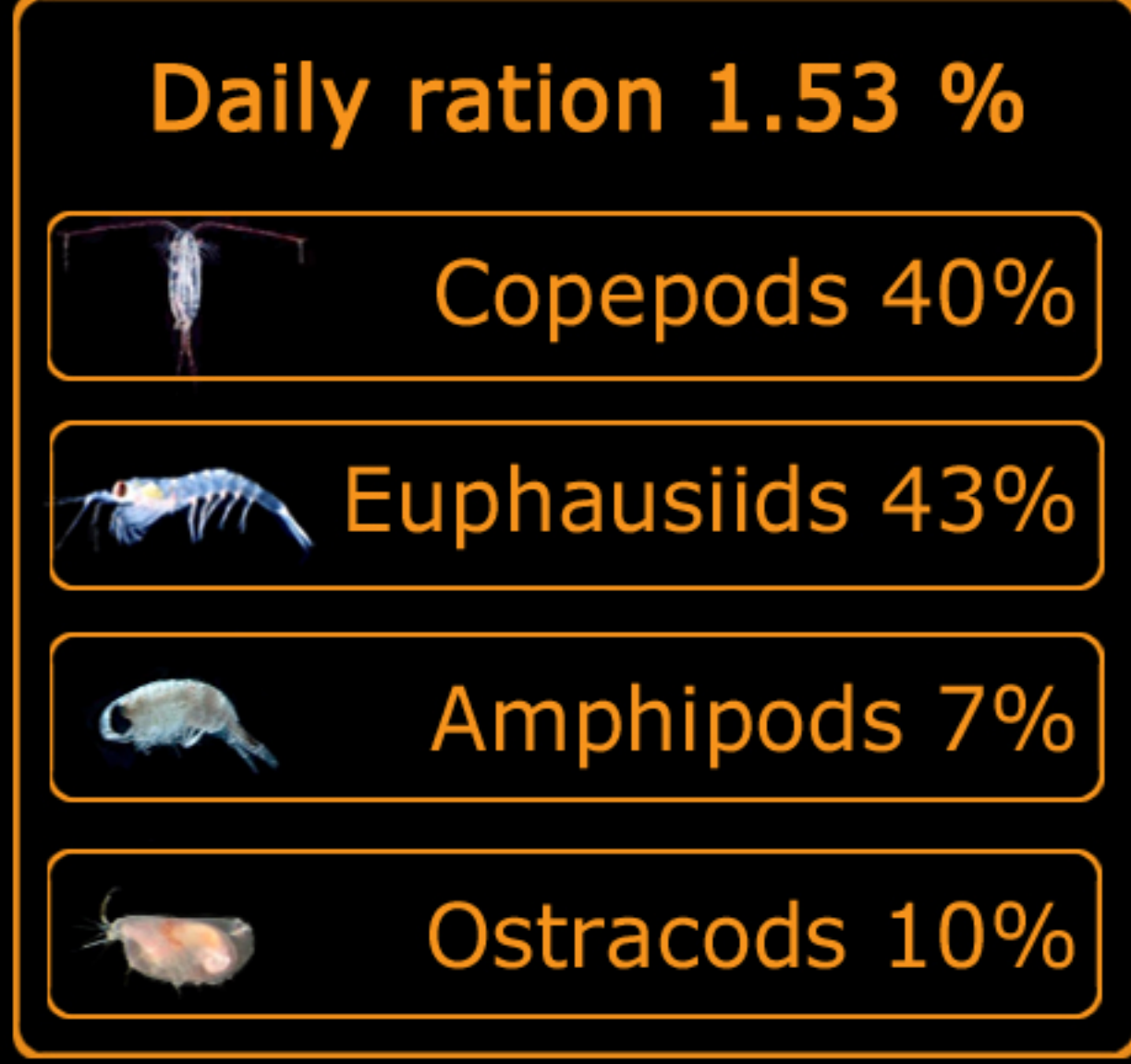
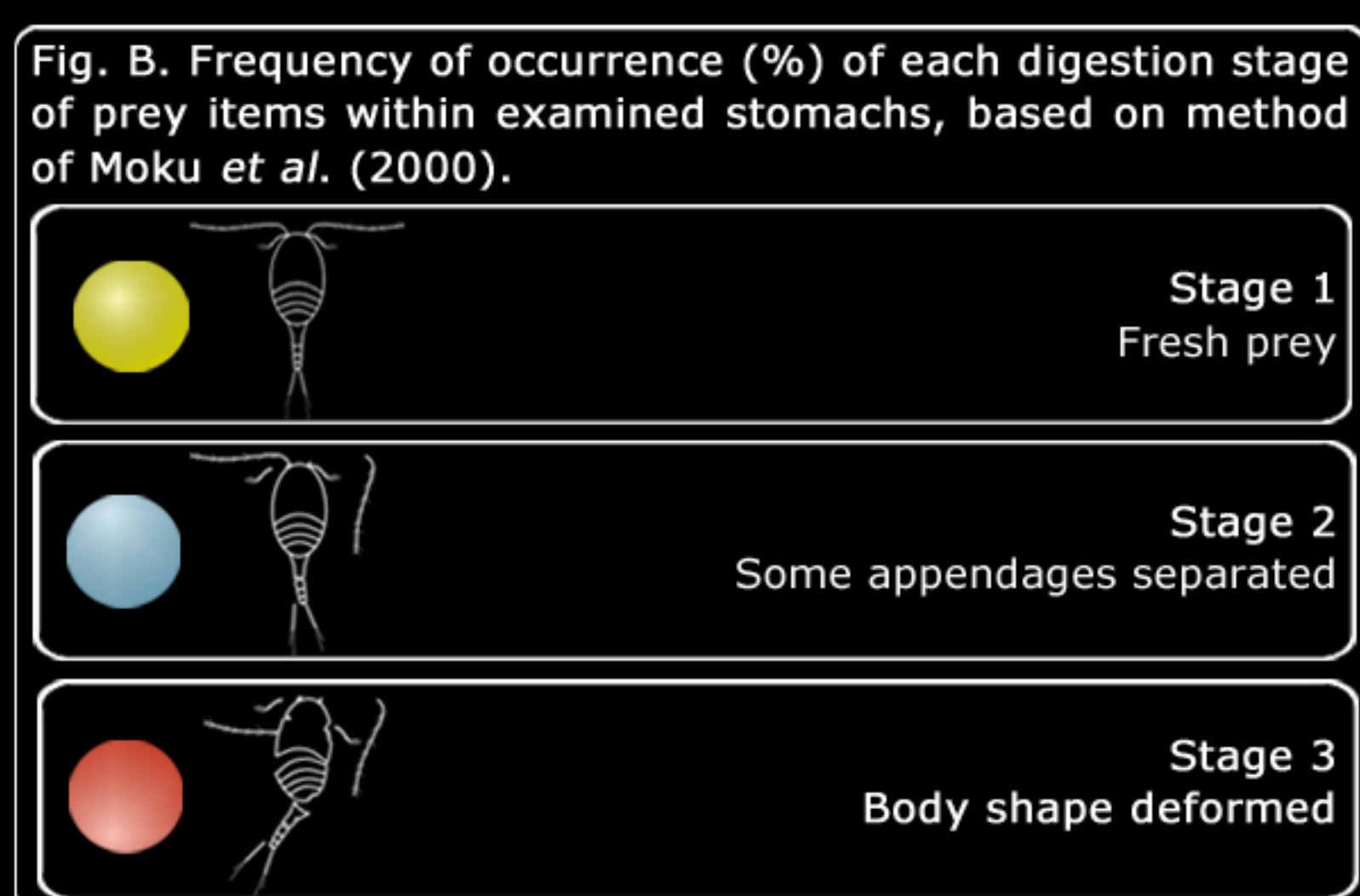
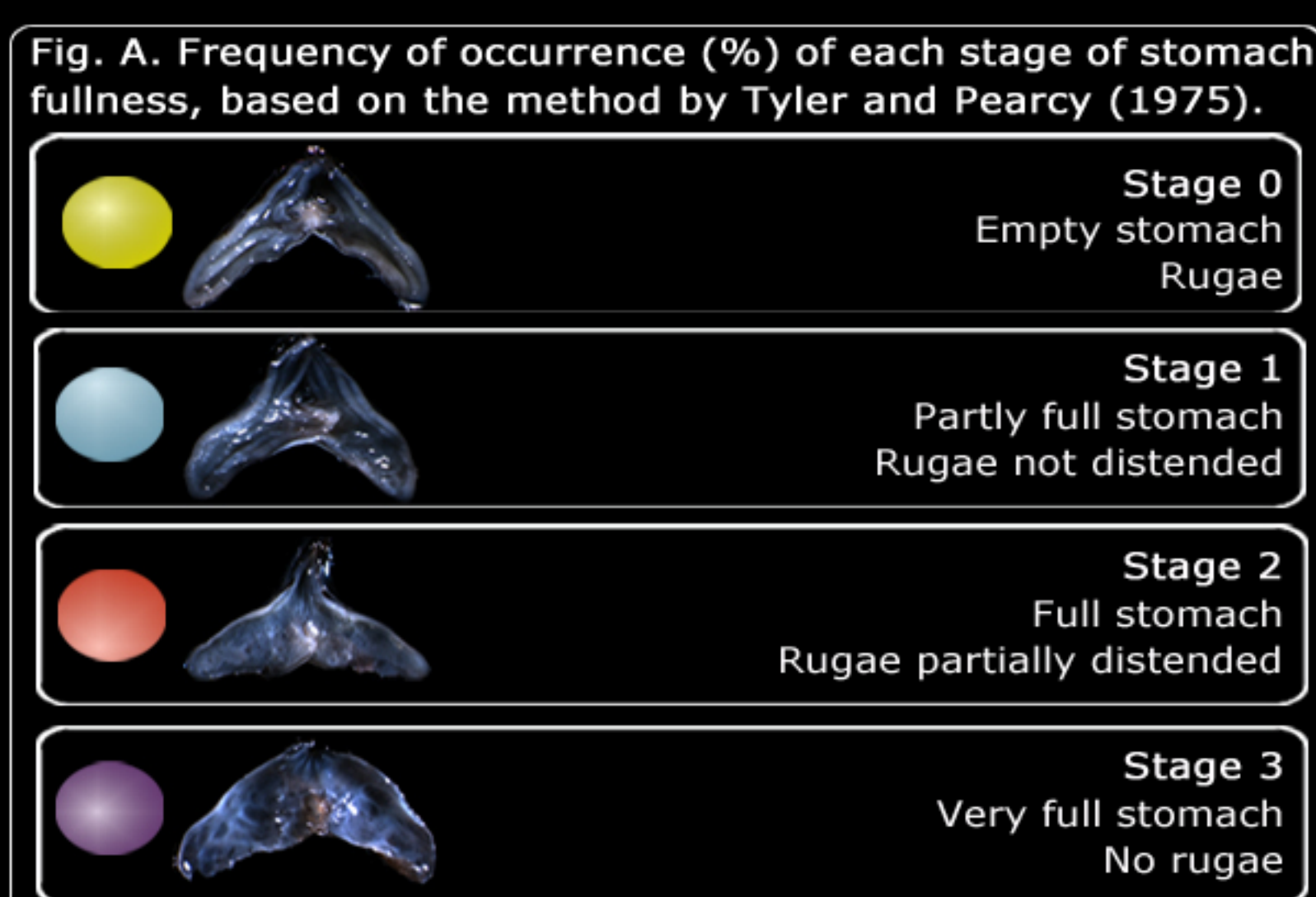


DSL: Deep Scattering Layer ; ML: Migrant Layer

Hygophum hygomii



DSL: Deep Scattering Layer ; ML: Migrant Layer

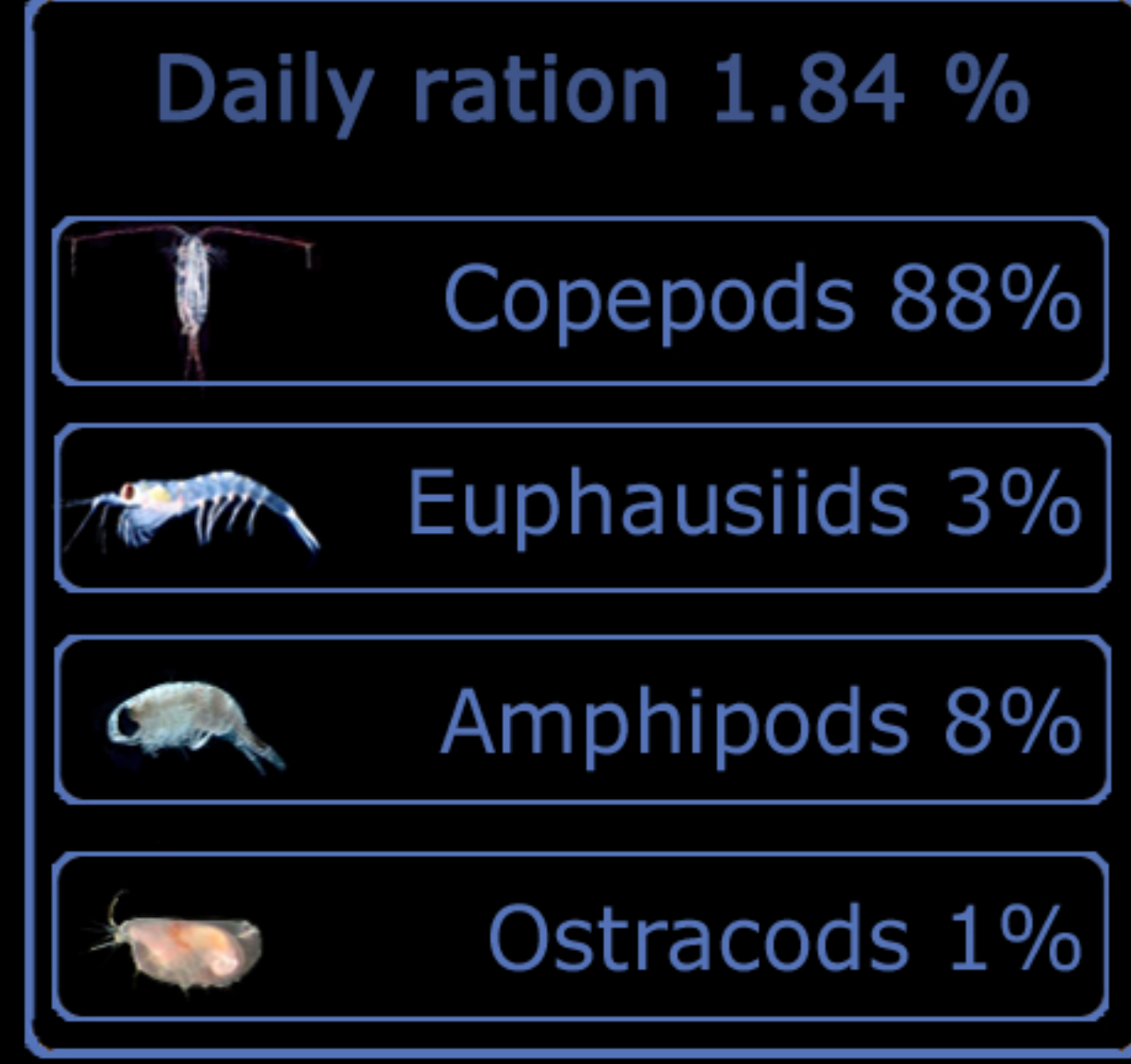


Material and Methods.

Feeding chronology was approached by studying stomach fullness (Fig. A) and state of digestion of prey items (Fig. B) in individuals from two hauls performed at afternoon and midnight in the Deep Scattering Layer (DSL) and the Migrant Layer (ML), respectively. Preliminarily, twenty stomachs per species and haul were studied.

The daily ration was expressed as a percentage of body weight and was calculated by dividing the dry weight of the stomach contents by the dry weight of the fish body. We only used individuals that were classified as stage 3 in stomach fullness scale (n = 7 in *L. dofleini* and n = 3 in *H. Hygomii*).

Diet was obtained by studying the composition of stomach contents only from the shallower midnight haul (20 stomachs per species) because of the easier identification. Diet is given as the percentage of individuals of each taxonomic group found within the stomachs.



Results and discussion.

Feeding chronology revealed a prevailing nocturnal feeding, preying mainly on copepods and euphausiids. The daily consumption was up to 1.5% in both species, which is in agreement with the reported data in the literature concerning subtropical species (Pakhomov *et al.*, 1996). On the other hand, the occurrence of full and partly full stomachs during afternoon in mid waters, as well as the absence of fresh preys, suggests non-diel feeding but a slow stomach evacuation rate, also suggesting that most of the ingested carbon in the epipelagic is efficiently transported to the mesopelagic zone. This feature is of importance to the study of the biological pump efficiency. However, more exhaustive studies throughout the diel period are needed to confirm these preliminary results.

Acknowledgements: We would like to thank the scientific team and the crew of the RV "La Bocaina" for fieldwork assistance. This work was supported by the project "Acoustic detection, behaviour and use of the habitat in deep-diving odontoceti", funded by US Office Naval Research and conducted by La Laguna University and Woods Hole Oceanographic Institution. Alejandro V. Ariza was supported by a postgraduate grant from the Spanish Ministry of Science and Innovation (BES-2009-028908).

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