The Herpetological Bulletin 160, 2022: 23–24
SHORT COMMUNICATION

https://doi.org/10.33256/hb160.2324

# Food supplementation of the Montpellier snake *Malpolon monspessulanus* in the wild

GREGORY DESO[1*], ALOYS CROUZET[1] & XAVIER BONNET[2]

[1]AHPAM - Association Herpétologique de Provence Alpes Méditerranée, Maison des Associations, 384 route de Caderousse, 84100 Orange, France
[2]Centre d'Étude Biologique de Chizé, UMR-7372, CNRS-Université de La Rochelle, 79360, Villiers en Bois, France

[*]Corresponding author e-mail: ahpam.contact@gmail.com

Under natural settings, a variety of snake species are occasional scavengers, especially piscivorous snakes and pit vipers (DeVault & Krochmal, 2002). In the case of the Montpellier snake *Malpolon monspessulanus* the species has been observed both eating bait intended for other animals and roadkill (Valverde, 1974; Ventura, 2012). Several researchers have taken advantage of the propensity of wild snakes to accept carrion (e.g. mammals, fish) offered by humans to address a variety of ecological questions (Sazima & Strüssmann, 1990; Marques & Sazima, 1997; Wasko & Sasa, 2012; Glaudas & Alexander, 2017). Further investigation of the foraging response of wild snakes to carrion offered by researchers is of interest because it has the potential to improve animal welfare, for example to place electronic devices without the need for force-feeding (Shine, 1987). It could also be used to supplement the food intake of wild snakes, thereby promoting reproduction and recruitment in fragile populations (Taylor et al., 2005). Weitzmann & Pretus (2018) made an unsuccessful (prey not consumed despite snake interest) attempt at food supplementation with the Montpellier snake and this led us to undertake a feeding test in 2021 in Bédarrides, Vaucluse district, France, with two large free-ranging male Montpellier snakes both in the range of 1.7-1.8 m long and 1.5 to 1.6 kg body mass.

We offered different food items (approximately 20-110 g). The mass of the meals was estimated to be in the range of the prey commonly consumed by large Montpellier snakes (e.g., small to large rodents). We placed the food items in locations where snakes were frequently observed during the study and used a video trap to monitor the snakes' behaviour (Num'Axes Trail Camera PIE 1023) (Fig. 1). We tested three types of easily available food items: chicken legs, quail eggs, and chipolata (pork) sausages (Table 1). Chicken legs were presented alone, eggs and sausage together. Tests where the bait was quickly covered by ants were discarded.

Chicken legs were tested five times with the first snake and once with the second snake (Table 1). The first snake found

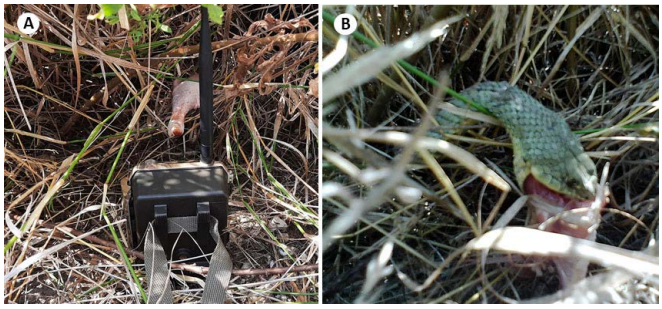


**Figure 1**. Setting food supplementation tests for Montpellier snakes - **A.** A camera trap (Num'axes) was positioned by food deposited in a place frequently used by snakes, **B.** A successful test, the snake swallowed the chicken leg (BHS video, 2022)

**Table 1**. Details of dietary supplementation tests with Montpellier snakes (#1 and #2) using different food items

| | | | Time of various activities | | | | |
|---|---|---|---|---|---|---|---|
| | | | | | Swallowing | | |
| Snake # | Food type | Date | Food deposited | Snake detects food | Begins | Ends | Test outcome |
| **1** | Chicken leg | 18 Jun | 11:44 | 12: 22 | 13:15 | 13: 36 | Successful |
| **1** | Chicken leg | 29 Aug | 10:44 | - | 13:42 | 14: 00 | Successful |
| **1** | Chicken leg | 5 Sept | 14:00 | - | 17:00 | NA | Successful |
| **1** | Chicken leg | 16 Jul | 15:00 | - | - | - | Unsuccessful |
| **1** | Chicken leg | 13 Sept | 13:10 | - | - | - | Unsuccessful |
| **1** | Quail egg + chipolata sausage | 30 Jun | 17:00 | - | - | - | Unsuccessful |
| **2** | Chicken leg | 1 Sept | 11:35 | 14:10 | - | - | Unsuccessful |
| **2** | Quail egg + chipolata sausage | 24 Jun | 10:10 | 11: 05 | - | - | Unsuccessful |

and ate chicken legs on three occasions (BHS video, 2022) but rejected it twice while the second snake twice showed interest in the chicken leg but did not eat it on either occasion (Table 1). Both snakes were tested once with the egg and sausage combination but neither consumed the food.

Video recording is an essential means for describing behaviours that are difficult to observe and quantify in the field (Ballouard et al., 2016; Clark, 2006; Glaudas et al., 2017) and on this occasion has been used to reveal the first successful food supplementation for a wild Montpellier snake. We recommend using video monitoring to assess potential benefits and disadvantages of food supplementation. This process, which allows remote monitoring from a mobile phone, is a technology that is not yet widely used for behavioural monitoring of snakes. However, it is particularly appropriate because i) most wild snakes are scared by humans and are reluctant to eat in their presence and ii) it is essential to determine which animal has eaten the food supplement (e.g., the targeted snake species, scavengers, or potential snake predators).

## ACKNOWLEDGEMENTS

We thank Xavier Glaudas, Nicolas Dubos, and Ivan Sazima for useful comments.

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*Accepted: 2 December 2021*