

Reptile behaviour in natural refuges - 4. Maternal philopatry and non-predatory post-hatching interaction in the Montpellier snake *Malpolon monspessulanus*, with a link to video evidence

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Reptilian parental care may involve complex social interactions (Gans, 1996) and include diverse strategies such as nest-site fidelity, nest guarding and communal nesting (Brown & Shine, 2007; Doody et al., 2009). More specifically, in snakes, the females of egg-laying (oviparous) species typically make substantial reproductive investments in vitellogenesis and oviposition but this is followed by little or no postnatal care (Shine, 1988; 2003). In contrast, some live-bearing snakes exhibit temporary maternal attendance, although the prevailing pattern is for limited post-hatching interaction, contributing to the perception that snakes are largely asocial. Philopatry, the return of individual snakes to specific sites such as hibernacula is well known in some species, e.g. old world vipers, but much less so in the case of the return of oviparous species to oviposition sites. Here I describe a novel observation of a female Montpellier snake *Malpolon monspessulanus*, an oviparous species, returning to its oviposition site in a communal refuge in consecutive breeding seasons (2024 and 2025) with no attempt at cannibalism but instead apparently inspecting hatchlings in a manner suggesting an element of parental care.

The observation was made in a communal refuge that has been subject to long-term monitoring in north-eastern Iberia. The site consists of interconnected galleries and chambers providing suitable microhabitat conditions for reptile oviposition and incubation. Several reptile species use this refuge regularly, making it a local hotspot of reproductive activity (Serrano-Fochs, 2019). Adult female *M. monspessulanus* have been recorded at the site every breeding season but individual identification of the females has normally been very difficult. In 2024, camera traps detected a large female bearing a distinctive dorsal wound that served as a natural mark for recognition (Fig. 1; BHS video, 2026: clips #1 & #2). The presence and behaviour of this snake at that time were consistent with oviposition. The same wound allowed her unequivocal re-identification when she was inspecting the oviposition site again in 2025 (BHS video, 2026: clips #3 & #4).

During the 2025 breeding season, two distinct hatchling clusters were recorded in the refuge. The first cluster emerged on 5–6 August, and the second from the eggs of a different female emerged around 16 August (BHS video, 2026: clip #5). On this latter occasion, several *M. monspessulanus* neonates from the second cluster were present, indicating that hatching had occurred recently. Camera footage documented the wounded female approaching one of the neonates from the second clutch

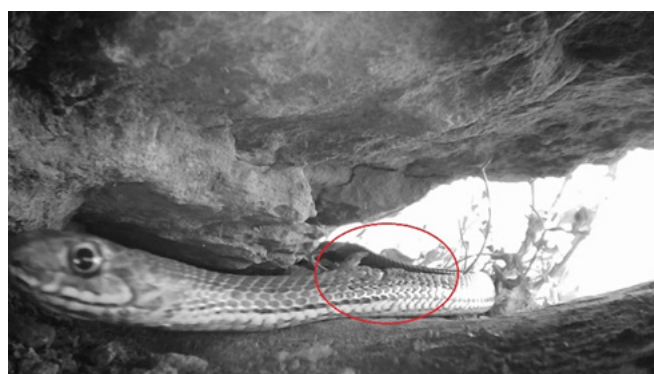


Figure 1. Adult female *Malpolon monspessulanus* with a dorsal wound (red ellipse) enabling individual recognition over successive years

while repeatedly tongue-flicking (BHS video, 2026: clip #6). The female snake then paused briefly, remaining motionless before resuming tongue-flicking and advancing towards the hatchling until physical contact occurred. After another pause, it moved away to inspect the chamber where the previous clutch had hatched ten days earlier, and subsequently withdrew from the refuge, showing no predatory behaviour towards the neonates. Such behaviour is highly unusual as, in most snakes, females disperse immediately after oviposition, and no post-hatching contact is expected. Furthermore, the hatchlings did not show avoidance or defensive behaviour in her presence. This contrasts sharply with the strong startle responses they typically exhibit when confronted with other reptiles (Serrano-Fochs, 2026a). The female's return provides compelling evidence of maternal philopatry in *M. monspessulanus*. Her reuse of the same refuge across consecutive breeding seasons parallels the nest-site fidelity described for *Tropidonophis mairii* (Brown & Shine, 2007) and supports a growing recognition of complex nest-site selection strategies among reptiles. The refuge in this study, with its stable microclimate and structural protection, matches the type of preferred habitat that Brown & Shine (2007) associated with repeated site use in snakes. Philopatry therefore appears to be an adaptive strategy.

More remarkable than philopatry, however, is the non-predatory post-hatching interaction observed between the adult female and the neonates. The repeated tongue-flicking in close proximity to neonates, without any sign of aggression, suggests that chemosensory cues play a role in mediating recognition. In snakes, such cues are known to be essential for mate attraction, sex discrimination and aggregation (Mason

& Parker, 2010), and they have also been observed during *M. monspessulanus* courtship through cloacal rubbing (Serrano-Fochs, 2026b). The same chemical communication system may therefore be co-opted for kin recognition.

The absence of predatory behaviour is striking because cannibalism is a known trophic strategy in *M. monspessulanus* (Franch & San Sebastián, 2013; Recuero et al., 2010) and is opportunistic in many snake lineages (Polis & Myers, 1985). The apparent inhibition of predation in this context could reflect a kin-selected mechanism that favours recognition of related offspring or in this case at least neonates from the same oviposition site. Recent research shows that eggshells can retain a distinct microbial ‘maternal signature’ derived from the female’s cloaca and skin (Li et al., 2022). This signature could provide a chemical basis for individual or kin recognition shortly after hatching. Such inhibition of cannibalism has been described as a fundamental component of more complex reptilian parental care systems (Gans, 1996).

These social interactions likely arise within communal nesting systems, which promote proximity among multiple females and their offspring. Communal nesting provides well-documented thermal, anti-predator and conspecific cueing benefits (Doody et al., 2009), it may facilitate repeated use of optimal refuges across generations, creating reproductive hotspots where aggregations occur not only during mating but also oviposition and subsequent hatchling emergence (Graves & Duvall, 1995). In this context, natal philopatry and matrilineal nest-site fidelity (Brown & Shine, 2007) could enhance the probability of kin encounters, creating the ecological framework for social interactions among related individuals and potentially even across snake species. In this light, the observed behaviour may not be an isolated anomaly but rather an overlooked by-product of communal reproduction that may represent an adaptive strategy to maximise reproductive success.

Taken together, this observation integrates philopatry, communal nesting, active inhibition of offspring cannibalism, chemical communication and trophic ecology into a novel perspective on snake behaviour. The combination of site fidelity and non-predatory post-hatching inspection challenges the long-standing model of strict postnatal abandonment in oviparous snakes. Instead, under suitable ecological conditions, subtle social interactions among kin, and potentially even between unrelated conspecifics or other snake species, can emerge, mediated by chemical cues and reinforced by communal nesting dynamics. Although based on a single case, these findings highlight the evolutionary significance of maternal behaviour in snakes and underscore the need for closer monitoring of communal refuges, which are often overlooked after oviposition but may conceal parental care.

ACKNOWLEDGEMENTS

I thank the landowners for granting access to the study sites.

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Accepted: 17 November 2025