The love life of an apophallated slug

Petra A. Karlsson

Het liefdesleven van een ontmande slak

Samenvatting. Het paringsgedrag van de Grote aardslak *Limax maximus* werd bestudeerd in een terrarium. Een nieuw geïntroduceerde volwassen Grote aardslak en één van de al aanwezige zeven volwassen soortgenoten verkozen elkaar als partner. Toen het terrarium van 60 x 40 x 30 cm horizontaal stond faalden pogingen van dit slakkenpaar om te paren; pas toen de bak verticaal was gezet leek dit te gaan lukken. Maar nu bleek dat het grootste exemplaar geen penis had en er kon dus via de penissen van beide dieren geen uitwisseling van spermapakketjes plaatsvinden. Klodders uitscheiding van het kleinere dier, mogelijk spermapakketjes, eindigden doelloos op de ruiten van het terrarium. De waarnemingen – die zijn vastgelegd in een video – roepen allerlei vragen op, zoals: Waarom heeft een ontmande slak toch nog drang om te paren? Komt dit verschijnsel ook in de vrije natuur voor of is het een 'in vitro' artefact? Voelen naaktslakken zich werkelijk exclusief tot elkaar aangetrokken? Schuilt er dan een nog onbekende sociale component in het complexe liefdesleven van slakken? Het 'gepassioneerde' gedrag van de hier geobserveerde slakken geeft alle ruimte voor interpretaties die aan menselijk gedrag refereren.

Introduction

As a pet snail hobbyist I'm always eager to add new live animals to my collection, so when a friend brought me a big, beautiful *Limax maximus* she had caught sliming about her garden last spring I was more than happy to "adopt" the little pest. This slug had thick black stripes as markings instead of the dotty colouration more familiar to me, and I thought what lovely offspring might hatch from its eggs. To my delight the new slug soon took fancy of a slightly smaller individual, out of the group of seven other adult specimen of *Limax maximus*. Whilst gastropods are known for their promiscuity and preference for several partners, these two appeared to have eyestalks only for each other. One would lead the other nightly seeking for the perfect branch to serve as a support for the slime rope and eventual copulation.

Room to cope

The slugs' housing was an aquarium of about 70 litres, measuring 60 cm width, 40 cm height and 30 cm depth. The height of this aquarium is not enough for the peculiar mating ritual of this species. Yet, the slugs attempted to mate several times, lowering themselves down the slime rope only to tumble down to the substrate before they managed to finish mating. I turned the aquarium on its side to create a 60 cm high space to entice the slugs to attempt mating again, and this seemed to work. The slug couple was able to descend down the slime rope without hitting the bottom too soon.

The first time this happened I was observing and managed to record almost the entire encounter. The slugs began by the smaller individual delivering several vicious-looking radula rasp bites at the other animal's mantle and mid part of the body (from my observations I assume this is done to test the other slug's interest in mating). The target slug started moving slowly and the other began following; apparently some signal was given that the attention was welcome as sometimes the targeted slug simply quickly escapes out of reach instead. The follower kept very close to the leader at all times, nibbling at the tail of the leader often. If the follower got left behind the leader stopped to wait until it felt a nibble at its tail. They slimed around the tank for about 15 minutes before settling on the wall at the top part of the tank. Sticks were offered for climbing, but the slugs clearly preferred the smooth glass surface; I assume the sticks were not large enough to support the slime rope's formation. The animals soon began circling each other, secreting copious amounts of thick mucus until a coin sized flat blob of slime was formed between them (Fig. 1). They got closer to each other until their bodies were pressed together, gently rasping the skin of each other all the time to taste the mucus, I assume. Suddenly the slugs let go of the wall and began descending, twisting and twirling around each other, using the formed mucus as a supporting rope. Wrapped around each other's bodies the enamoured couple kept descending whilst twirling for a few minutes, both slugs still nibbling each other with their upper tentacles retracted.

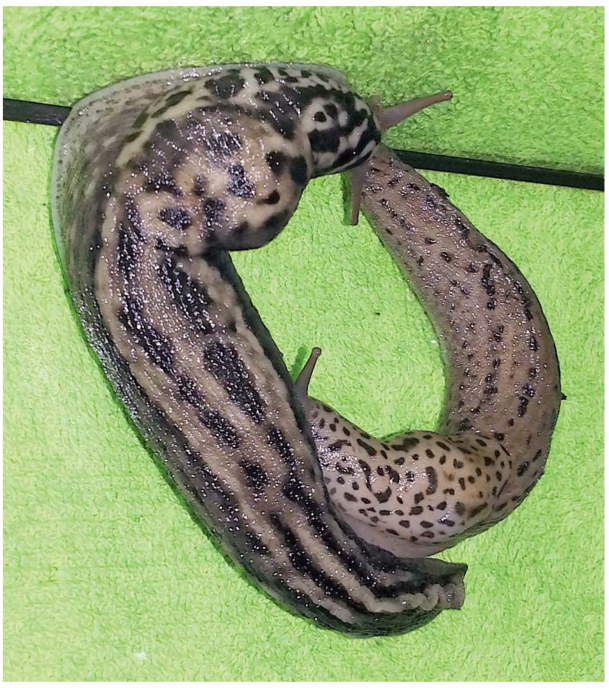

Fig. 1. *The two specimens of Limax maximus encircling each other. Photo: Petra Karlsson*

No success

Everything seemed normal copulation behaviour for this species, until it was time to evert the male genitalia. The larger slug appeared to have no male genitalia whatsoever; as the animal was already an adult at the time I got it I suspect it had lost its penis during a previous mating. It kept nibbling its partner whilst the partner dangled its penis, apparently trying to entwine it with the other slug for the sperm exchange as normally hap-

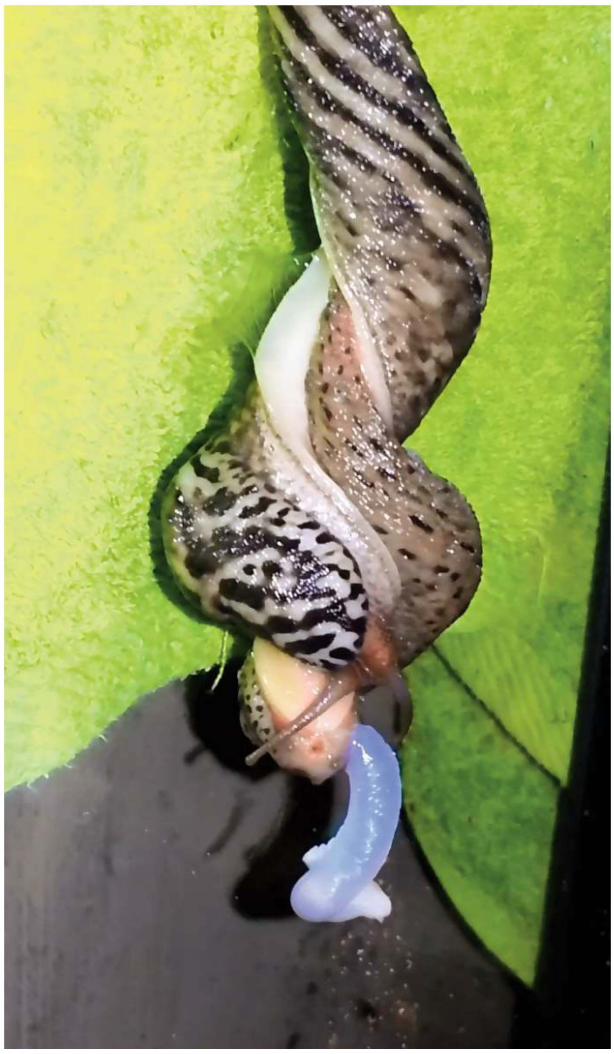

Fig. 2. Descend of the two specimens of *Limax maximus* on a slime rope. Still from the video by Petra Karlsson.

pens during mating (Fig. 2). Instead, it seemed that the larger slug continued nibbling and rasping its partner until the partner ejaculated. In the video a white blob can be seen coming out of the slug and then sliding down the tank wall. It is unclear what exactly the white substance is, although I first assumed it to be the slug's sperm; after viewing the video several times in my eyes it looks as if the white substance travels down the slug's transparent bluish genital towards the tip and exits as the slug writhes. In the following weeks I found a few similar white blobs dried on the wall below discarded slime ropes, which may indicate that exactly similar failed matings happened a few times without me witnessing them. I suspect the same pair of slugs produced those remains, given their visible attraction to each other which I observed on a daily basis; always resting side by side, showing signs of interest in mating more often than the other adult slugs. Unfortunately this couple could not produce any eggs, but observing their peculiar "love affair" has been almost as rewarding!

Questions remaining

This odd encounter raises all sorts of questions about the slugs' behaviour. Why does an animal with no means to mate still have a drive to copulate nonetheless? Does such happen in the wild or is it exclusively a captive occurrence? Is a real attraction possible between slugs? The love lives of slugs and snails are rich and full of complex behaviours; might there be a yet unknown social component to them, as well? My slugs certainly appear to be in the throes of passion in the video, the details in their expressions and little movements leaving plenty of room for human interpretation.

The full video can be viewed at:
http://youtu.be/fw4ymI2VMHk

Reference source

For comparison, the successful mating dance of *Limax maximus* (presented by Sir David Attenborough) can be viewed at:
http://youtu.be/FhVi4Z6CjZk

Adres van de auteur:
pkrlssn@gmail.com