

LIVING INSIDE THE RHINOCEROS

At 20 times the size of a House Fly, it is a veritable monster of the insect world. Still, the concept of size pales into insignificance when your only source of food is to be found deep within the belly of a rhinoceros!

by David Hood

The Rhino Botfly, *Gyrostigma pavesii*, is a seldom-observed member of the botfly family, Gasterophilidae. The adults lack mouth parts entirely, which accounts for their relatively short life span.

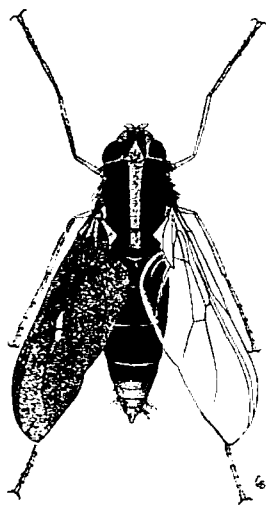
I have observed them on two occasions on Kwandwe Private Game Reserve near Grahamstown. Early on a cool June morning, we found one standing in a puddle just outside the lodge. Initially I mistook it for a Spider-hunting Wasp, being of the same general shape and size. It also had the slightly glossy sheen and orange legs of many wasps in this group – but something wasn't quite right. A closer inspection revealed the lack of long antennae, the hind wings reduced to halteres for balance in flight, and the difference in shape. It is nevertheless an effective mimic of a wasp capable of giving a painful sting! The insect was immobile so I left it, hoping it would warm up and perhaps find a rhino host.

Later that day things had warmed up considerably but the fly remained motionless in the shallow puddle. It had little energy for flight – it was dying. I picked it up for a closer inspection and it remained motionless on my hand. I took it inside where, to my horror, it had a last burst of energy, which sent it buzzing straight into a container of oil. It did not struggle. It had used up the last of a non-

renewable energy source!

That fly now resides amongst the ranks of insects in cases in the Albany Museum in Grahamstown as the most southerly record of its kind. It had completed a bizarre and poorly understood life cycle.

Had the fly we saw been successful, it would have laid a number of eggs on one or more rhinos. They could have been either the Black Rhino or the White



*The enormous Rhino Botfly adult attains a length of 36 mm.
DRAWING FROM ZUMPT, 1965*

Rhino. Other related botfly species parasitise the Asian rhinos. The eggs would have been attached firmly to the rhino's skin, usually around the ears, head and shoulders, but what happens next is still a mystery. The larvae of many related botflies burrow into their host's skin and work their way through to the stomach. This is the most likely course of action for the Rhino Botfly, but the first instar larvae have only been recorded from eggs hatched in a laboratory. The mature larvae can be found attached by means of hooks to the rhino's stomach lining. Here

they probably feed, like their relatives that parasitise horses, elephants and zebras, on the stomach contents of partially digested vegetation. Unusually amongst insects, they contain haemoglobin, which they need to facilitate the absorption of oxygen within the stomach of their host.

The third instar or third stage larva can reach a length of 40 mm before releasing its clutch on the stomach wall. It passes along the rhino's digestive tract, finally leaving the pachyderm's body in the dung. The maggot pupates either in the droppings or in the soil beneath. After about six weeks the black puparium hatches into a giant fly, which burrows its way out of the dung to freedom and commences the search for a mate.

Thus ends the lifecycle of this remarkable insect. The maggots of these flies have previously been found on the reserve by Professor Martin Villet of Rhodes University, but as fly larvae are so difficult to identify, the adult is often important for conclusive identification. Because the adult fly is short lived, it is very seldom seen.

The first recorded specimen was found, surprisingly, in a west European zoo. Rhino had been brought from Africa to the zoo and it is confidently surmised that the fly came with them. The adult fly has also been observed in northern KwaZulu-Natal in South Africa, in Zambia, Kenya, Tanzania, Ethiopia and the Democratic Republic of Congo. The larvae are regularly found in the stomachs of rhino in southern Africa during autopsies.

Visitors to reserves where rhino occur should keep a watchful eye open for these flies and report them to an entomologist in the area. Simply contacting the zoology department of the nearest university will lead you to the appropriate expert and you may be rewarded with the satisfaction of being the first to

The Rhino Botfly is unable to feed and dies within a few days of hatching from a large black puparium.





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These third instar larvae were found during an autopsy on a white rhino. The enormous maggots of the Rhino Botfly can be 40 mm in length

White Rhino near an Eastern Cape waterhole, close to where the Rhino Botfly was discovered. The White Rhino is host to the Rhino Botfly, which spends most of its life as a larva attached to the rhino's stomach wall.

The phenomenon of flies living in the bodies of other living creatures for part of their life cycle is called "myiasis". This was the speciality of the late Professor Fritz Zumpt from the South African Institute for Medical Research. His fascinating book on the subject is long out of print, but interested readers may find it in a library. Zumpt, F.K.E., 1965, *Myiasis in man and animals in the old world: A textbook for physicians, veterinarians and zoologists*, Butterworth, London.

identify the insect in a new locality. Although collecting live specimens is seldom recommended, if not for research purposes, dead or dying specimens will always be appreciated.

It is entirely possible that this fly has simply not been detected in the Kwandwe surrounds before although rhino have existed in nearby protected reserves for more than a decade. The fact that this is the most southerly record of its kind may, however, indicate that it has been brought to the area within the

stomachs of introduced rhino. Rhino are not treated for these parasites before being translocated.

Despite the paucity of adult sightings, the Rhino Botfly is a common parasite of rhino elsewhere in southern and East Africa and the larvae have not been shown to cause any pathological effects in their hosts.

Thanks to Professor Martin Villet for information supplied and for ensuring that this rare specimen rests in a safe repository.

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