

of the pathogen, the alkaloid profile, physiology and mode of infection, and some aspects pertaining to the epidemiology and ecology of the disease.

Claviceps species have traditionally been identified according to morphological characteristics as well as the hosts from which they were recorded. However, morphological features within species tend to be variable, and description of a new species based solely on the host is inconclusive due to the polygeneric host range of the majority of ergot fungi.

Attempts to circumvent the problem led to the establishment of varieties, special forms or races, and host-specific groups. Other means of distinguishing between species, such as alkaloid profiles and the ability to float on water, have also been utilized to identify chemo-races and habitat specialization.

In recent years, much emphasis has been placed on the application of molecular



Grass seed head, showing some seeds replaced with *Claviceps microcephala*



Claviceps purpurea (close-up)

envelopes (not plastic) to the following address:

methods (including DNA studies) for verifying identities and detecting genetic variability in *Claviceps* species.

Anyone encountering specimens of grasses or sedges infected with fungi that may belong to this genus, is requested to collect some seed heads, dry the samples in a plant press or even in a telephone directory, and post them in clearly marked paper

ELNA J. VAN DER LINDE

MYCOLOGY UNIT,
BIOSYSTEMATICS DIVISION,
ARC-PLANT PROTECTION RESEARCH
INSTITUTE

Mycology Unit,
National Collection of Fungi
ARC-Plant Protection Research Institute
P/Bag X134
Queenswood 0121
PRETORIA

Phone: (012) 304-9568
Fax: (012) 325-6998
E-mail: VDLindeE@arc.agric.za



Important:

Please include all collection information, i.e: Locality of collection (farm, district, nearest town, etc.), date of collection, name of collector, name of host plant (scientific or common name, if known).

THE ERGOT FUNGUS, *CLAVICEPS*, ON GRASSES:

A SPECIAL REQUEST FOR SPECIMENS

ELNA J. VAN DER LINDE

Mycology Unit,
Biosystematics Division,
ARC-Plant Protection Research Institute



Grass seed heads showing some seeds replaced with *Claviceps purpurea* sclerotia



FUNGI ON GRASSES: *CLAVICEPS* SPP. (ERGOT)

This is an earnest request to everyone in southern Africa who comes across a grass or sedge with fungus-infected seed heads, to assist in a research study by collecting and sending specimens to the address given at the end of this pamphlet.

A PhD study on *Claviceps* of nut-sedge was completed in 2005. Collection and submission of further specimens will enable follow-up research studies. These studies will result in various publications, as well as a better understanding of several aspects, including phylogenetic placement of South African and southern African species.

Because of the vastness of the country, as well as the fact that the fungal survival structures are only found / are visible on grasses and sedges during



Seed head of nut-sedge, showing dark, elongate, curved sclerotium of *Claviceps cyperi*.

February–May of each year, it is almost impossible for one person to cover all areas in search of them. It would therefore be much appreciated if botanists, farmers, entomologists, etc., would be on the look-out for these fungi and send specimens to the National Collection of Fungi (address below).

‘Ergot’ refers to the infection of ovaries in the florets of cereals and grasses (*Poaceae*), sedges (*Cyperaceae*) and rushes (*Juncaceae*) by 47 described and various undescribed fungal species of the ascomycete genus *Claviceps* (*Clavicipitaceae*, *Hypocreales*).

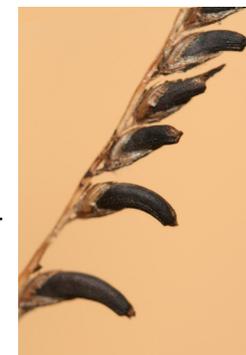
A total of 509 species in the *Poaceae*, 17 in the *Cyperaceae* and 4 in the *Juncaceae* have been reported as hosts, although the actual number of poaceous hosts is considerably higher. The disease destroys between 5 and 10 % of the seed in infected heads, but its main importance is the sclerotia (survival structures) which are poisonous to humans and animals



Nut-sedge seed head, with *Claviceps cyperi* exuding droplets of honeydew.

due to various tetracyclic ergoline toxins - collectively referred to as ergot alkaloids - contained in them.

Consumption of ergot-infected fodder leads to ergotism, a toxicosis characterised by psychotic delusions, nervous spasms, convulsions, gangrene, abortion, infertility and reduction in milk production. Ergot poisoning continues to be of economic importance as an animal disease, with outbreaks regularly being described in swine, sheep, horses, poultry, and particularly cattle. Mortalities are, however, rare and after removal of the source of intoxication, it takes about two months for milk production to return to normal and the symptoms to abate.



Dark, elongate sclerotia of *Claviceps digitariae* on florets of *Digitaria* (Smuts finger)

The research on *C. cyperi* elucidated the morphology, taxonomy and phylogeny