interrelationship occurs when *B. bassiana*, *D. destructor*, *D. dipsaci* and potato plants occur together, especially where *B. bassiana* is used as a bio-control agent against other pests. Two independent greenhouse experiments were conducted to investigate the influence of *B. bassiana* (isolate: Naturalis) on the damage potential and reproduction factors of *D. destructor* and *D. dipsaci* on potatoes. One potato tuber was planted per pot (700 cm^3) and the surrounding soil drenched with 10ml *B. bassiana* (isolate: Naturalis; concentration- 5x10 conidia ml^{-}). Two weeks later, plants were challenged with 2000 nematodes per pot. The experiments were laid out in a complete randomised design, replicated 8 and 10 times for experiment 1 and 2, respectively. The duration of the experiments was 12 and 16 weeks, respectively. In experiment 1, aboveground plant fresh and dry weights were not influenced by any treatments ($P > 0.05$). However, tuber numbers and weight were significantly reduced ($P < 0.05$) by the presence of nematodes or the combination of *B. bassiana* and nematodes. In the absence of nematodes, *B. bassiana* treatments had no influence on potato tuber weight. Nematode reproduction factors were significantly $P < 0.01$) higher in the presence of *B. bassiana*. An increase in the duration of experiment during experiment 2 led to increased damage caused by the nematodes. Tuber numbers and weights differed significantly among the treatments. Tuber damage and nematode reproduction factors were higher, when both *B. bassiana* and nematodes were present, compared to treatments with nematodes alone. However, in the presence of *B. bassiana*, the number of *D. destructor* juveniles and *D. dipsaci* females were significantly reduced. Although *B. bassiana* is an effective bio-control agent against some nematodes, its occurrence together with *D. destructor* and *D. dipsaci* in the presence of potato plants result in an increase in potato tuber damage caused by *D. destructor* and *D. dipsaci*.

170 - Characterization of *Heterodera schachtii* populations

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The beet cyst nematode *Heterodera schachtii* (BCN) is a major problem in sugar beet production in Germany. Although resistant mustard and oil seed radish varieties are in use for decades, there is little information on the genetic variability of BCN populations. Since sugar beet varieties with resistance or tolerance to BCN have been introduced recently, this aspect is of increasing relevance. Twelve populations collected from different sites in North Rhine – Westphalia and Lower Saxonia in Germany, and one isolate from Jordan were characterized morphologically, molecularly, and in terms of their virulence. Results showed that the German populations varied in their virulence on several mustard and radish cultivars. The Jordanian population was very virulent on cauliflower cultivars. Three populations were used to inoculate *Arabidopsis* growing on in vitro culture to test whether the differences of the virulence will follow that same pattern under these conditions. The results have shown that the populations have shown the same pattern of virulence (Fig. 1). The characterization of the populations is an important step in analyzing the genetic variability of BCN populations and their relevance in resistance management in sugar beet production.

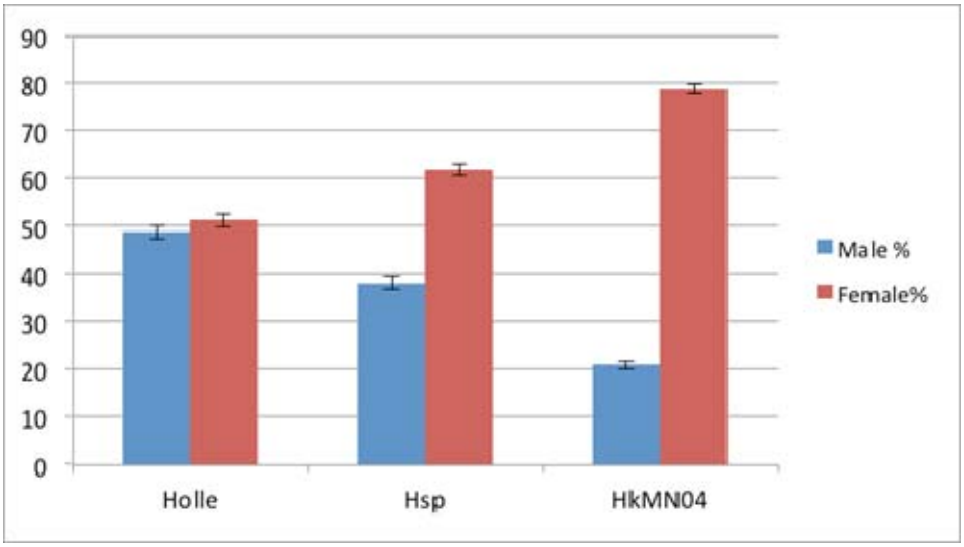

Fig. 1 The results of the infection assay of three *H. schachtii* populations on *A. thaliana*

171 - Virulence characterization of cereal cyst nematode populations (*Heterodera avenae* Wollenweber) from Egypt and host responses of wheat cultivars

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The cereal cyst nematode (CCN), *Heterodera avenae* Wollenweber, causes serious economic losses in cereal crops. The use of resistant germplasm to control CCN is considered cost effective and environmentally friendly. The use and effectiveness of resistant wheat cultivars varies according to the virulence phenotype of the nematode population. *Heterodera avenae* has been reported in wheat fields in Egypt. As yet there is no information available on the virulence and damage potential of these populations on wheat cultivars. In this study, *H. avenae* populations from five different locations representing the main wheat growing areas in Ismailia province and West Sinai, were characterized on a set of differential wheat cultivars and local Egyptian wheat varieties. Different growth parameters were recorded to determine the damage potential of *H. avenae* populations on wheat cultivars. All the tested wheat cultivars from Egypt were susceptible to *H. avenae* populations, while the differential cultivars 'Loros x Koga' and 'Aus 10894' were moderately resistant. The Egyptian populations of *H. avenae* could be assigned to pathotype Ha13. The local cultivar 'Sakha 93' was the only wheat cultivar that could be classified as tolerant to *H. avenae* populations in pot experiments. The reduction in grain yield of the Egyptian wheat cultivars by *H. avenae* ranged between 15 - 42% under greenhouse conditions. There is a need to search for sources of resistance to CCN among Egyptian wheat germplasm or to introduce resistant germplasm from another cereal for Egyptian breeding programs.