



MICROBIOLOGICAL IMAGE

The fungus *Nomuraea rileyi* growing on dead larvae of *Anticarsia gemmatalis* associated with soybean plants (*Glycine max*) in Esperanza (Argentina)



Aislamiento de una cepa agresiva de *Nomuraea rileyi* desde larvas muertas de *Anticarsia gemmatalis* en Esperanza, Argentina

Leopoldo Palma^{a,b,*}, Eleodoro Eduardo Del Valle^{a,b}

^a Facultad de Ciencias Agrarias, Universidad Nacional del Litoral, Esperanza, Santa Fe, Argentina

^b Consejo Nacional de Investigaciones Científicas y Técnicas, Argentina

Received 1 April 2015; accepted 22 June 2015

Available online 9 September 2015

The biological control of agricultural pests by using different entomopathogenic microorganisms has been significantly increased in the last years, due to the need of reducing the amount of chemical insecticides in agricultural ecosystems.³

Nomuraea rileyi (Farlow)² is one of the most important natural enemies of the velvet bean caterpillar, *Anticarsia gemmatalis* (Hübner), which is the most damaging foliage-feeding pest of soybean crops in Argentina and the United States.¹

Here we report the isolation of an aggressive strain of *N. rileyi* during natural epizootics of *A. gemmatalis* larvae soybean field in Esperanza, province of Santa Fe (Argentina). This finding occurred fortuitously during an expedition aimed at collecting soil and larva samples.

Affected dead larvae were completely covered by white mycelia, which turned green after sporulation (Fig. 1). A bioassay was conducted in the laboratory by adding a drop (10 µl) of an aqueous spore suspension directly over the cuticle of healthy *A. gemmatalis* larvae. The microscopic examination of mycelia obtained in the bioassay exhibited the typical ramification of conidiophores produced by this fungus (Fig. 1).

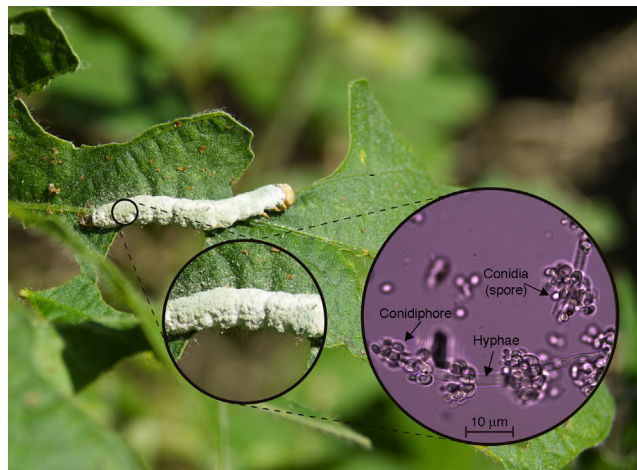


Figure 1 Dead larvae of *A. gemmatalis* affected by *N. rileyi* in a soybean plant (*Glycine max*). Detail of the sporulated mycelia and the typical conidiophore structures found under microscopic analysis (1000×). The image of dead *A. gemmatalis* larvae was obtained using a Nikon D3000 digital SLR camera whereas the microphotograph was obtained in our laboratory, using a Leica DM750 microscope and its incorporated ICC50 digital microscope camera (Leica Microsystems).

* Corresponding author.

E-mail address: lpalma@fca.unl.edu.ar (L. Palma).

Ethical disclosures

Protection of human and animal subjects. The authors declare that the procedures followed were in accordance with the regulations of the relevant clinical research ethics committee and with those of the Code of Ethics of the World Medical Association (Declaration of Helsinki).

Confidentiality of data. The authors declare that no patient data appear in this article.

Right to privacy and informed consent. The authors declare that no patient data appear in this article.

Conflicts of interest

The authors declare that they have no conflicts of interest.

Acknowledgements

This study was supported by the programme Curso de Acción para la Investigación y el Desarrollo, CAI+D, of Universidad

Nacional del Litoral. We thank Dr. Colin Berry for his kind revision of the manuscript.

Appendix A. Supplementary data

Supplementary data associated with this article can be found, in the online version, at [doi:10.1016/j.ram.2015.06.004](https://doi.org/10.1016/j.ram.2015.06.004).

References

1. Bortolotto OC, Pomari-Fernandes A, de F. Bueno RCO, de F. Bueno A, Stopa da Kruz YK, Queiroz AP, Sanzovo A, Ferreira RB. The use of soybean integrated pest management in Brazil: a review. *ASB*. 2015;1:25–32.
2. Devi PS, Prasad YG, Chowdary DA, Rao LM, Balakrishnan K. Identification of virulent isolates of the entomopathogenic fungus *Nomuraea rileyi* (F) Samson for the management of *Helicoverpa armigera* and *Spodoptera litura* (identification of virulent isolates of *N. rileyi*). *Mycopathologia*. 2003;156:365–73.
3. Glare T, Caradus J, Gelernter W, Jackson T, Keyhani N, Kohl J, Marrone P, Morin L, Stewart A. Have biopesticides come of age. *Trends Biotechnol*. 2012;30:250–8.