



Field survey of *Phakopsora pachyrhizi* on several hosts in Argentina

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INTRODUCTION

In Argentina the commercial agriculture region represent 23 million has. and the 48% correspond to soybean crop (Satorre, 2003). The wide soybean production area is characterized by a great diversity of climates and phytogeographical provinces (Cabrera, 1976). Legumes are an important botanical taxon present in this area with many native species.

Asian soybean rust (ASR) caused by *Phakopsora pachyrhizi* Syd. & P. Syd. requires living tissues to survive and to pass the unfavorable season, in absence of the soybean crop. Host range play an important role in the epidemiology of soybean rust fungi. In the world, *P. pachyrhizi* infects over 95 species from 42 genera (most of them Fabaceae) (Bromfield, 1984), including soybean and related *Glycine* species.

Argentina has 103 species of Fabaceae in temperate and subtropical regions (excluding the following phytogeographical provinces: Puna, Monte, Grassland of ridge mountains, Montano forest, Montana rain forest and Patagonia) described as possible inoculum reservoirs at the soybean growing area (Neumann & Formento, 2004).

The objective of this study was to determinate the possible host range of *P. pachyrhizi* in diverse provinces from Argentina since 2003 until 2005.

MATERIALS AND METHODS

During 2003-05, several native, exotic, invasive and domesticated legume species were collected from Misiones, Chaco, Formosa and Entre Ríos provinces of the northeast of the country. They were botanically determinated and studied with rutinary techniques, observing the foliage to detect similar rusts as *P. pachyrhizi*. In all cases the exat ubication was determinate with GIS.

Other species from diferent botanical Family to Fabaceae (Convolvulaceae, Commelinaceae and Poaceae) with similar rusts were scouted analyzed too.

Leaf samples showing rust symptoms were submitted to the Instituto Ewald A. Favret (Instituto Nacional de Tecnología Agropecuaria) for Polymerase Chain Reaction assay according to Frederick *et. al* (2002).

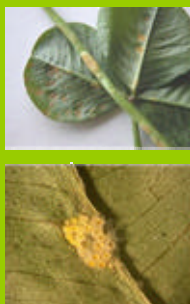
RESULTS AND DISCUSSION

All species from the Fabaceae family were determinated (Table 1) but the causal agent of ASR (*P. pachyrhizi*) was not detected on them.

At the beginning of 2003 kudzu (*Pueraria lobata*), mucuna (*Stylobium niveum*) and guandul (*Cajanus cajan*), three tropical species, were determinated as *P. pachyrhizi* hosts by molecular techniques. Since 2004, only kudzu (*P. lobata*) in Misiones province and volunteer soybeans (*Glycine max*) in Corrientes, Entre Ríos, Santa Fe and Misiones were identified as natural hosts of ASR in Argentina (Table 2).

Trifolium repens (white clover): Until now only was observed *Uromyces trifolii-repentis*. PCR assays resulted negative to ASR (Fig. 1 and 2).

Fig. 1 and 2. *Uromyces trifolii-repentis* acedidia on stem and ribs of white clover leaflets.



Other rusts observed on: *Medicago lupulina* (uredinia), *Vigna luteola* (uredinia) and *Desmosium spp* (acedidia)

Table 1. Legume species studied to detect ASR during 2003-05

Nº	Host	Common name	Nº	Host	Common name
1	<i>Arachis</i> spp.	-	18	<i>Melilotus albus</i>	Trébol de olor blanco
2	<i>Bahinia</i> spp.	-	19	<i>Melilotus indica</i>	Trébol de olor amarillo
3	<i>Cajanus cajan</i>	Guandul	20	<i>Pennisetum clandestinum</i>	Kikuyo
4	<i>Vigna sinensis</i>	Chaucha metro	21	<i>Phaseolus lunatus</i>	Poroto manteca
5	<i>Correlinia</i> spp.	Flor de Santa Lucia	22	<i>Phaseolus</i> spp.	Poroto alubia
6	<i>Delonix regia</i>	Chivato - Malinche	23	<i>Phaseolus</i> spp.	Poroto colorado
7	<i>Desmodium affine</i>	Pega pega	24	<i>Phaseolus</i> spp.	Poroto enano
8	<i>Desmodium incarnum</i> DC.	Pega pega	25	<i>Pisum sativa</i>	Arveja
9	<i>Desmodium</i> spp.	Pega pega	26	<i>Pueraria lobata</i> var. <i>lobata</i>	Kudzu
10	<i>Erythrina crista-galli</i>	Seibo	27	<i>Rhynchosia diversifolia</i>	-
11	<i>Glycine javanica</i>	Soja perenne	28	<i>Rhynchosia Senna</i>	-
12	<i>bonnea</i> spp.	-	29	<i>Stylobium niveum</i>	Mucuna
13	<i>Lotus</i> spp.	Trébol de cuernitos	30	<i>Trifolium pratense</i>	Trébol rojo
14	<i>Macropitium</i> spp.	-	31	<i>Trifolium repens</i>	Trébol blanco
15	<i>Macrotium axillare</i> cv. <i>Acher</i>	-	32	<i>Vigna adenantha</i>	Vigna
16	<i>Medicago lupulina</i>	Trébol de carretilla	33	<i>Dolichos lablab</i>	Chaucha mojarita
17	<i>Medicago sativa</i>	Ailfalfa	34	<i>Wisteria sinensis</i>	Glicina

Vigna adenantha, *Neonotonia whigthi* (syn. *Glycine javanica*), and *Dolichos lablab* were analyzed with PCR assay to determinate the real pathogen.



Table 2. Scouting results during the 2004-05 growing season in 3 species detected positive to ASR during 2003-04.

Host	Province	Location	ASR
Kudzu (<i>Pueraria lobata</i>)	Misiones	INTA EEA Cerro Azul	Positive
	Misiones	Loreto	Positive
Guandul (<i>Cajanus cajan</i>)	Santa Fé	Paraja Los Laureles	Positive
	Misiones	INTA EEA Cerro Azul	Negative
	Chaco	Pampa Bedogni	Negative
Mucuna (<i>Stylobium niveum</i>)	Chaco	Paraja La Rioja	Negative
	Chaco	J. J. Castelli	Negative
	Misiones	INTA EEA Cerro Azul	Negative
	Chaco	El Boquerón	Negative
Formosa	Tres Islas	Laguna Blanca	Negative
	Formosa	Formosa	Negative
	Formosa	Colonía El Alba	Negative

Fig. 3 and 4. Invading Kudzu with ASR in Loreto's Rain forest, Misiones province during september 2004.



Until now, kudzu, *Pueraria lobata* (Willd.) Ohwi (Fig. 3 and 4) and the soybean volunteer plants (*Glycine max* L.) Merril are only the two species known as hosts of *P. pachyrhizi* in this country.

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