

TRACEABILITY OF INFESTED PLANT GERMPLASM USING NEMATOLOGICAL ANALYSIS DATABASE BY THE INFORMATION COMPUTER SYSTEM.

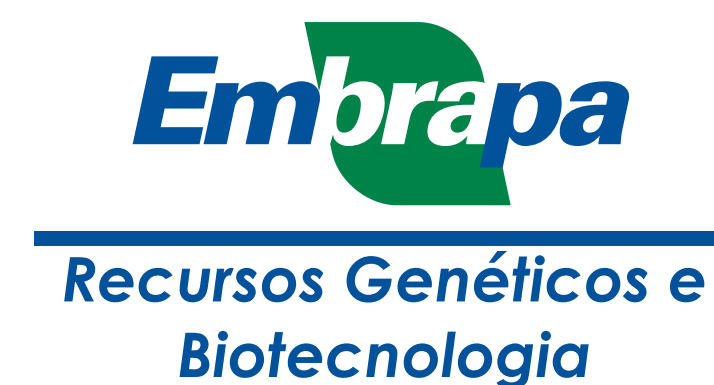
Rastreabilidade de germoplasma vegetal usando a base de dados das análises nematológicas através do sistema computacional de informações

Vandor R.V. Rissoli¹; Hugo R.F. Silva²; Juvenil E. Cares³; Renata C.V. Tenente² & Henrique I. Nascimento²

¹Universidade Católica de Brasília, Brasil vandor@ueb.br

²Embrapa Recursos Genéticos e Biotecnologia renata@cenargen.embrapa.br

³Universidade de Brasília, Brasil cares@unb.br



Ministério da Agricultura, Pecuária e Abastecimento



INTRODUCTION

The picture of the global trade among countries and economic blocks is facing new facts, as the exchange of goods tends to rise.

Many countries, specially the ones that signed the World Trade Organisation (WTO) Protocols, are implementing better safety procedures which enforce strong phytosanitary measures, avoiding risk of entry, establishment and spread of exotic nematodes, in production areas of the importer country.

As a member of MERCOSUL (Common Market of South Trade) and countersigned to the International Plant Protection Convention (IPPC), Brazil has the rights and obligations regarding international trade which derive mainly from the WTO Agreement on the Application of Sanitary and Phytosanitary Measures.

Other WTO Agreements such as the Technical Barriers to the Trade Agreement may also be relevant in certain circumstances. The IPPC is recognised by the WTO under the Application of Sanitary and Phytosanitary Measures.

Brazil is represented by the National Phytosanitary Protection Organization (NPPO) of the Agricultural Defence Secretary (ADS) of the Ministry of Agriculture, Livestock and Food Supply (MAPA) and their main objectives regarding international trades are: exclusion of exotic plants and pests; pests detection; establishment of Integrated Pest Management Programs; improvement of international trade of commodities.

NPPO is also responsible for implementing phytosanitary measures for Brazil and also the protection of the natural fauna and flora.

In addition, Brazilian Agricultural Research Corporation (Embrapa) / Embrapa Genetic Resources and Biotechnology has the mandate given by the NPPO, to establish Plant Quarantine Station Level One, through accord Code Federal Regulation "DOU/MAPA, Portaria SDA no. 11, February 15th, 2002". Associate with the tasks involving quarantine activities are the technical support to the NPPO, including the establishment of databases of pests of economic and quarantine importance to Brazilian agriculture.

Their propose activities that are being improved by the many steps include:

"Development of one computer system with all the information of biological data to support quarantine services, such as inspection and detection of pests".

Therefore, the creation of a query system was requested to attend new phytosanitary policies and this was under developed by the Nematology Laboratory of Plant Quarantine of Embrapa Genetic Resources and Biotechnology.

OBJECTIVE

The aim of this work is to use a Query System of information of exotic nematodes and display information on these quarantine pests to Brazil through the Embrapa Genetic Resources and Biotechnology that was developed and which allows to search through the name of the pest, host plant or country of origin, as well as other aspects. The other purpose is giving support, by this dataset, to the customs offices and quarantine institutions in Brazil or any part of the world, mainly for the detection of non-existing pest in the country.

MATERIAL AND METHODS

According to the Comitê de Sanidade Vegetal dos Países do Cone Sul (COSAVE - Plant Phytosanitary Committee of South Trade) quarantine pests can be divided into two categories:

- **Pest A1** - They are not yet present in a country;
- **Pest A2** - They are present but not widely distributed and being officially controlled.

Biological information has been gathered on a number of quarantine pests associated with different hosts, including all species of *Ditylenchus*.

The dataset had informations on:

- Scientific and common names;
- Geographical origin;
- Associated Host (scientific and common names);
- Quarantine aspects of these parasites;
- Recovered Bibliography refer to nematode species.

The project should continue to complete other important groups of plant-parasitic nematodes as stated by COSAVE and also ones of the economic importance and exotic to Brazil.

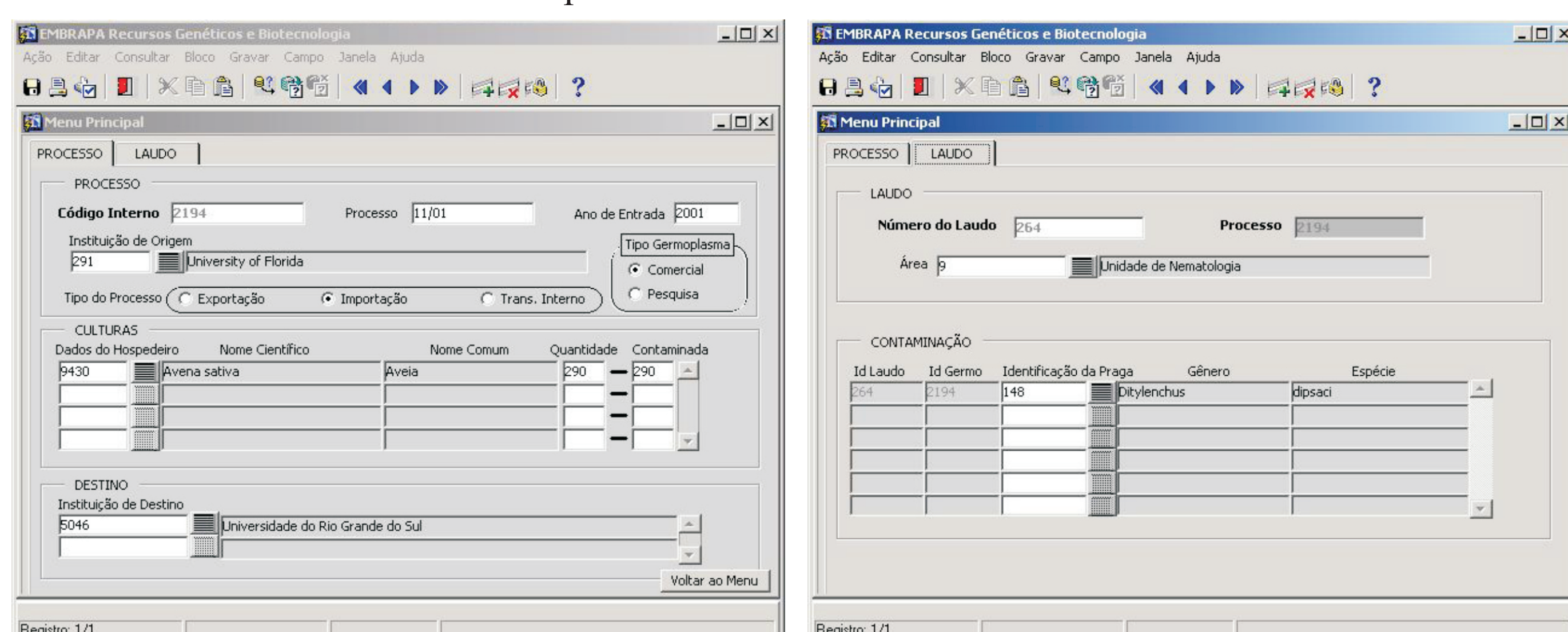


Figure 1 - Windows work of new system, showing the survey of specific imported oat accession with *Ditylenchus dipsaci*.

It is important to mention that these lists are not static because the pests can be eliminated from determined area or can be introduced in new part of the country, and it has a obligation to send all detected nematodes, special ones that is exotic to the country that is a member of COSAVE.

RESULTS

The computer system of the Nematological Laboratory of Embrapa Genetic Resources and Biotechnology, denominated Sistema de Informação de Germoplasma (SIG), consists of a database showing of the results of nematological analysis from imported plant into Brazil.

The detected nematodes of this work are shown in Table 1 and some examples of nematode images in Figures 2 to 6 and in , which present the view of this query system; the important species of this group of nematodes (*Ditylenchus*) and the view of all items that have to be filled for each species, respectively.

SIG permits a fast and accuracy interaction with data of intercepted exotic nematodes of the genus *Ditylenchus*, from 1981 to 2005.

The contribution to traceability of intercepted nematodes in Brazil and to phytosanitary risk alert of the national agriculture could be done by SIG.

Table 1. Exotic species of *Ditylenchus* detected in imported materials

Intercepted Nematodes	Country of Origin	Germplasm	Warning
<i>D. parvus</i>	1 st USA	Rice / seeds	Exotic
<i>D. dipsaci</i> (*)		Oat, Guizotia & Sorghum / seeds	List A1
<i>Ditylenchus medicaginis</i>		Peanut / seeds	Exotic
<i>D. obesus</i>		Cowpea / seeds	Exotic
<i>D. myceliophagus</i>		Onion & Cauliflower / seeds	Exotic
<i>D. dipsaci</i>	2 nd Mexico	Maize / seeds	List A1
<i>D. acutus</i>	3 rd France	Potato / tubers	Exotic
<i>D. equalis</i>		Grape / stake	Exotic
<i>D. dipsaci</i>		Melon / seeds	List A1
<i>D. emus</i>	3 rd France	Grape / stake	Exotic
<i>D. triformis</i>	3 rd France	Grape / stake	Exotic
<i>D. myceliophagus</i> e	3 rd France	Grape / stake	List A1
<i>D. equalis</i>	4 th Colombia	Guilameplants de Vigne	Exotic
<i>D. equalis</i>	4 th Colombia	Rice / Seeds	Exotic
<i>D. terricolus</i>	4 th Colombia	Bromélias / seedlings	Exotic
<i>D. nanus</i>	4 th Portugal	Coffee seedlings	Exotic
<i>D. triformis</i>	4 th Portugal	Olive / seedlings	Exotic
<i>D. dipsaci</i>	5 th Argentina	Soybean	List A1
<i>D. emus</i>	5 th Australia	Mirtaceae seedlings	Exotic
<i>D. dipsaci</i>	5 th Canada	Potato / tubers	List A1
<i>D. dipsaci</i>	5 th Peru	Potato / tubers	List A1
<i>D. nortoni</i>	5 th India	Grape / stake	Exotic
<i>D. dipsaci</i>	5 th Israel	Onion / seeds	



Figure - *Ditylenchus emus* female: (40x) a - Anterior part; b - tail; Male - c - tail (bursa, spicule).



Figure - *Ditylenchus filimus* female: (40x) a - Anterior part; b - Posterior part.

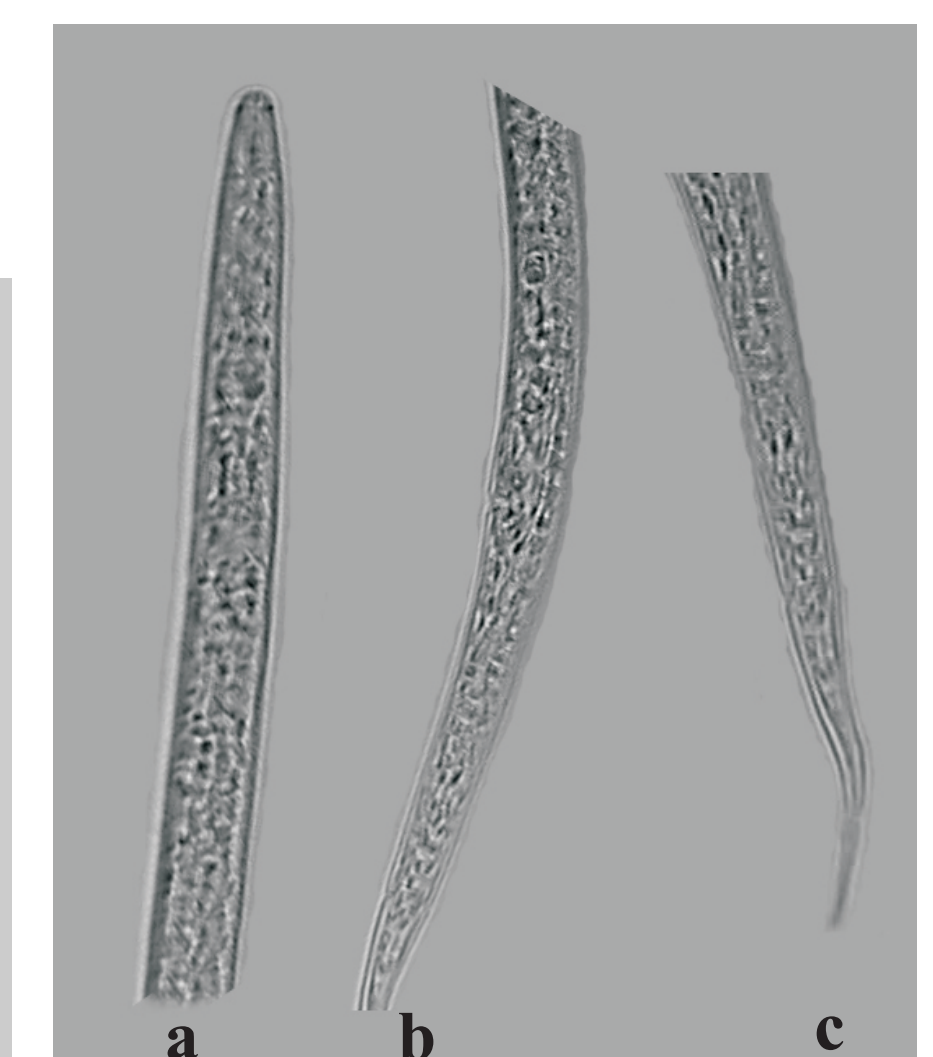


Figure 2 - *Ditylenchus triformis* female: (40x) a - anterior part; b - vulva; c - tail.

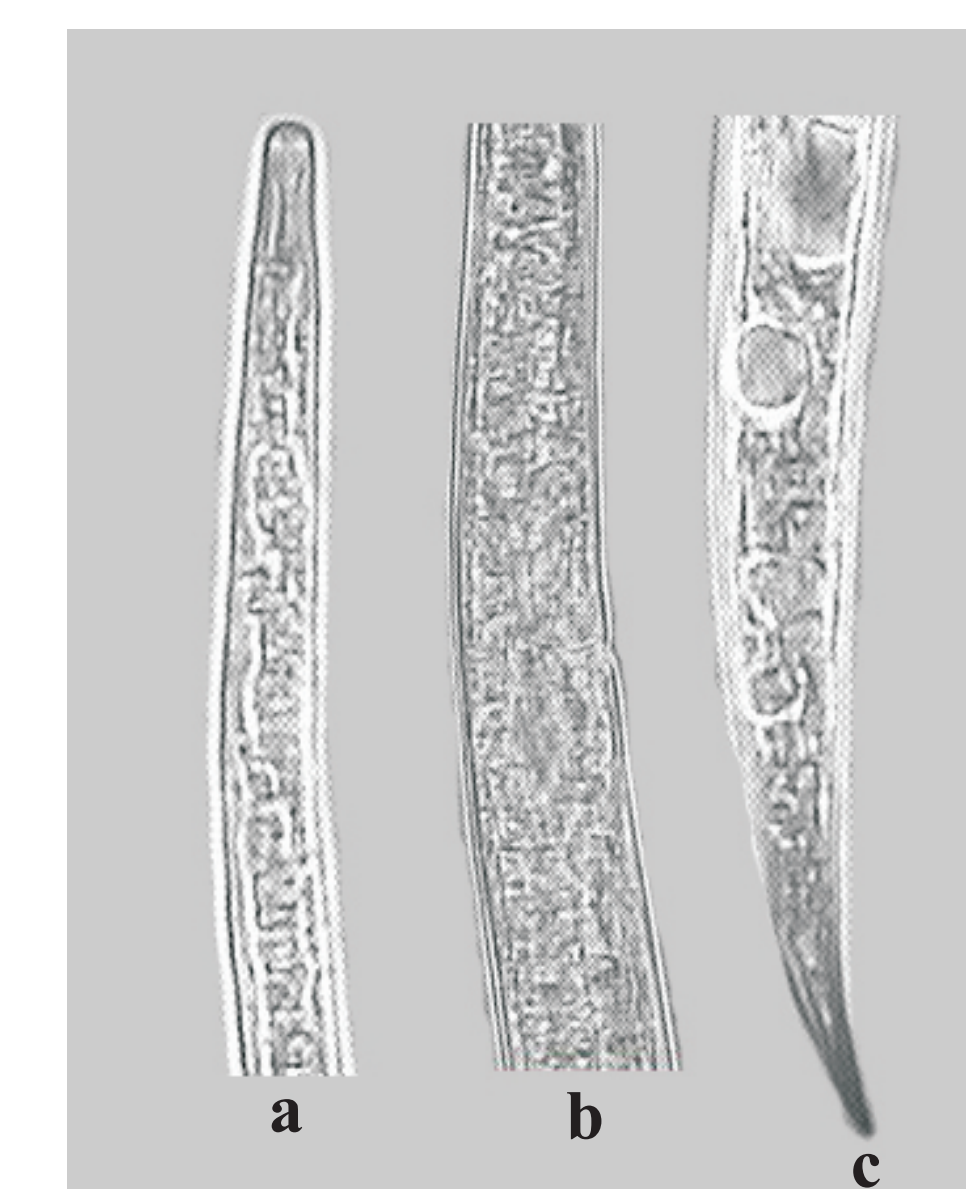


Figure - *Ditylenchus medicaginis* - female: (40x) a - anterior part; b - vulva; c - tail.

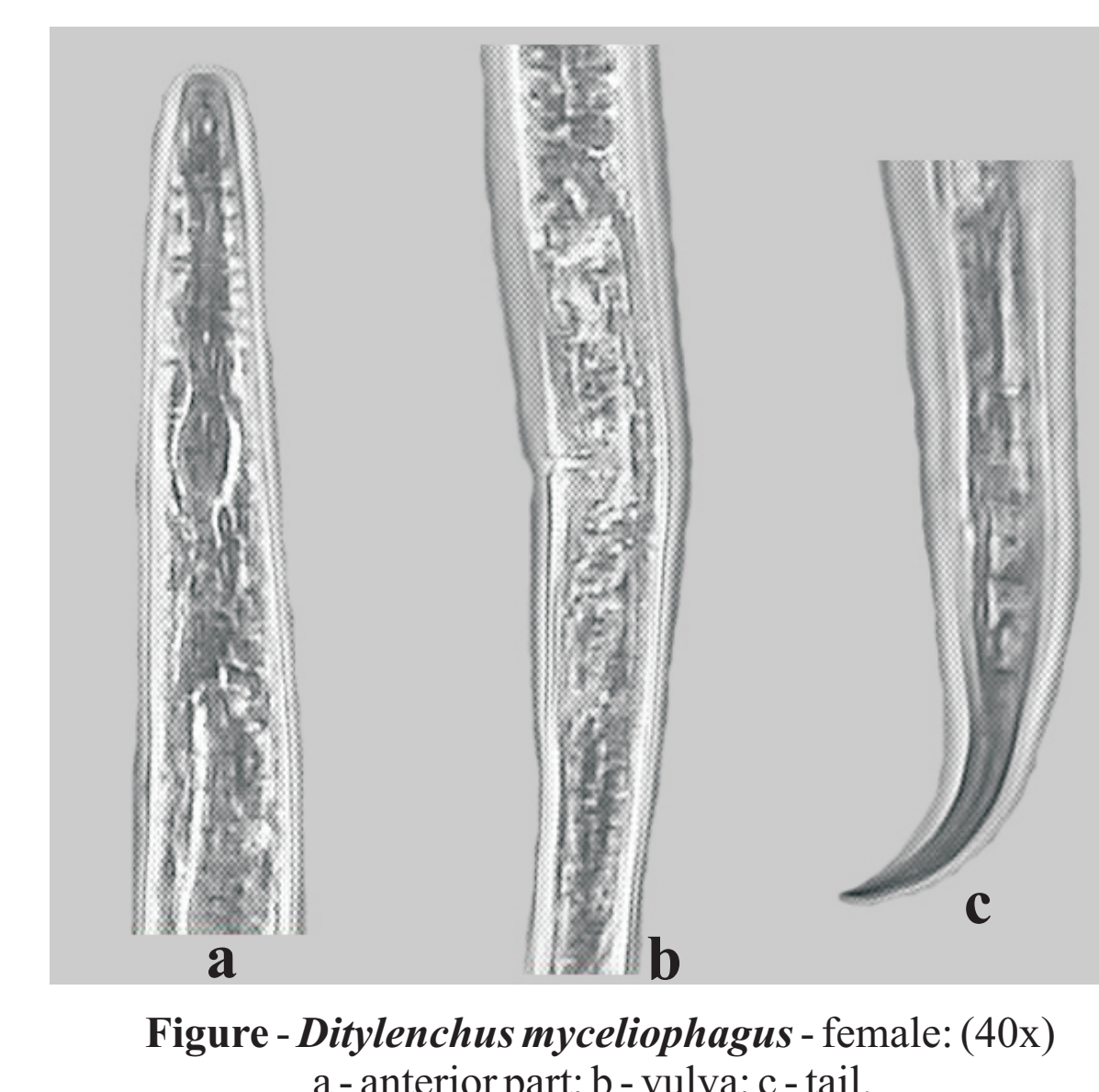


Figure - *Ditylenchus myceliophagus* - female: (40x) a - anterior part; b - vulva; c - tail.

CONCLUSION

These results have shown the analysis importance of this kind of search and to look about the exchange materials have to receive much more attention, special these mentioned countries.

This query system in the INTERNET will effectively collaborate in the reduction of the introduction of new species of nematodes into Brazil, as well as to improve the knowledge of the personnel at customs offices, professors and students regarding the danger of new pests introduction.