

***Phyrdenus divergens* and *Phyrdenus muriceus* (Coleoptera: Curculionidae)**

This short description has been prepared in the framework of the EPP0 Study on Pest Risks Associated with the Import of Tomato Fruit. The whole study can be retrieved from the EPP0 website.

EPP0 (2015) EPP0 Technical Document No. 1068, EPP0 Study on Pest Risks Associated with the Import of Tomato Fruit. EPP0 Paris [\[link\]](#)

Africa	Asia	Oceania	North America	South-Central America and Caribbean
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***Phyrdenus divergens* (no common name found) and *Phyrdenus muriceus* (broca da batatinha [Portuguese] gorgojo del tomate, barrenador del tallo de tomate [Spanish]) (Coleoptera: Curculionidae)**

Why	Identified in the EPP0 tomato study. These species seemed very similar at Step 2, but there are much fewer publications on <i>P. divergens</i> as a pest.
Where	<p>EPP0 region: absent</p> <p><u><i>Phyrdenus divergens</i></u> North America: Mexico, USA (Texas, Illinois, New York, Florida) (Peck and Thomas, 1998) Central America: Guatemala, Nicaragua, Costa Rica, Panama (Maes and O'Brien, 1990) Caribbean: Cuba (Peck and Thomas, 1998) South America: Brazil, Bolivia, Argentina (Maes and O'Brien, 1990); Brazil (Agrolink Brazil, ND), Venezuela (Morales et al., 2003).</p> <p><u><i>Phyrdenus muriceus</i></u> North America: Mexico, USA (Arizona, Florida) (Peck and Thomas, 1998; Maes and O'Brien, 1990) Central America: Belize, Guatemala, Honduras, Nicaragua, Costa Rica, Panama (Maes and O'Brien, 1990); Central America (Peck and Thomas, 1998) Caribbean: Cuba (Maes and O'Brien, 1990; Peck and Thomas, 1998) South America: Colombia, Brazil, Bolivia, Uruguay, Paraguay, Argentina (Maes and O'Brien, 1990); Venezuela (Morales et al. (2003).</p>
Climatic similarity	Medium. 6-7 common climates considering the distribution above, possibly lower (occurring in specific areas).
On which plants	Both species are pests of Solanaceae, and reported by Agrolink Brazil (ND) on potato, eggplant, tobacco, peppers and tomato. For <i>P. divergens</i> , tomato is also mentioned in Morales et al. (2003). Costa Lima (1956) also mentions several other <i>Solanum</i> spp. for Brazil.
Damage	<p>The biology of these species and organs attacked is not clear. Some sources indicate that they mostly attack roots and stems, while others consider they are also on foliage and fruit. SENESA (2010) mentions that eggs are laid in stems and the upper part of the plants, and that on tomato, larvae are located at the axils. Damage is due to larvae, which bore galleries in the foliage, stems, roots and branches, causing fall of fruit and flowers, and death of seedlings. Larval galleries are mainly located in the lower part of the stem, or in roots, and on potato also in tubers (SENESA, 2010; Agrolink Brazil, ND). Adults also attack tomato fruit, but damage is less important than that caused by larvae. Pupae are in the soil (SENESA, 2010). Peck and Thomas (1998) indicate that it attacks roots and seeds of tomato and eggplant. USDA (2013b) based on several sources, note that <i>P. muriceus</i> is present in stems and roots. Early publications mention that larvae prefer roots to stems (Costa Lima, 1956). Details on the biology of <i>P. divergens</i> were found only in Agrolink Brazil (ND), which indicates that larvae are in leaves and stems. It is not sure if there is a difference in biology (the same source indicating damage by both adults and larvae on leaves and on potato tubers for <i>P. muriceus</i>).</p> <p><i>P. muriceus</i> is a pest of tomato in Argentina, where treatment is applied (Novo et al., 2002; INTA, 2012). King and Saunders (1984) indicate that <i>P. muriceus</i> is normally minor but may become locally important. Vreugdenhil et al. (2011) mention that <i>P. muriceus</i> is a potato pest, especially in Bolivia, with larvae feeding in tubers, and adults on leaves and stems. Both species are mentioned amongst major pest of economic importance for tomato for South America by Berlinger (1987), although this is not really supported by the sources found.</p>
Dissemination	Adults fly.

Pathway	Plants for planting, fruit (esp. if green parts attached)?, potato tubers? of host plants, soil, from countries where <i>Phyrdenus divergens</i> or <i>P. muriceus</i> occur.
Possible risks	Solanaceous hosts of <i>P. divergens</i> and <i>P. muriceus</i> are major crops in the EPPO region. The climatic similarity according to the EPPO Study between the area where they occur and the EPPO region is medium. The reason to retain these species for Step 3 was because of a potential association with fruit (while other Curculionidae, such as <i>Faustinus</i> , <i>Trichobaris</i> and <i>Listroderes</i> , were eliminated at Step 2 as no life stage was associated directly with fruit). Association of <i>P. divergens</i> and <i>P. muriceus</i> with tomato fruit is still unclear, but it seems to be a pest of potato.
Categorization	None found.
Sources	<p>Agrolink Brazil. ND. http://www.agrolink.com.br/ (Accessed January 2014)</p> <p>Berlinger MJ. 1987. Pests. pp 391-441 In The Tomato Crop, A scientific basis for improvement (eds Atherton JG and Rudich J). Chapman and Hall, London - New York.</p> <p>Costa Lima, da A. 1956. Insetos do Brasil. 10.º Tomo. Coleopteros. 4.ª Parte. Escola Nacional de Agronomia, Série Didática. http://www.acervodigital.ufrj.br/insetos/insetos_do_brasil/conteudo/tomo_10/44_cryptorhynchinae.pdf (Accessed January 2014)</p> <p>INTA. 2012. Informe progresos 2011-2012. Asociación Tomate 2000. Programa para el aumento de la competitividad de la industria del tomate (PACIT). INTA, Centro Regional Mendoza – San Juan, Estación Experimental Agropecuaria La Consulta. La Consulta, Mendoza, Argentina</p> <p>King ABS and Saunders JL. 1984. The invertebrate pests of annual food crops in Central America. Overseas Development Administration, London. http://books.google.dk/books?id=qMwOAOAIAAJ&dq=agrotis+repleta+king&source=gbs_navlinks_s (Accessed January 2014)</p> <p>Maes JM, O'Brien CW. 1990. Lista Anotada De Los Curculionoidea (Coleoptera) De Nicaragua. Rev. Nica. Ent., (1990), 12:1-78.</p> <p>Morales V P, Cermeli M, Godoy F, Salas B. 2003. Lista de insectos relacionados a las solanáceas ubicados en el Museo de Insectos de Interés Agrícola del CENIAP _ INIA. Entomotropica 18(3):193-209.</p> <p>Novo RJ, Viglianco A, Vaudagna E. 2002. Efectos de insecticidas sobre el gorgojo de la papa, <i>Phyrdenus muriceus</i> (Germ.) (Coleoptera: Curculionidae). Agriscientia, 2002, Vol. XIX : 3-10.</p> <p>Peck SB, Thomas MC. 1998. A Distributional Checklist of the Beetles (Coleoptera) of Florida. Internet version. The Museum of Entomology, FSCA (Gainesville). http://www.fscadpi.org/Coleoptera2/ColeopteraFrame.htm</p> <p>SENASA. 2010. Sistema Nacional Argentino de Vigilancia y Monitoreo de Plagas. [Data sheets for pests in Argentina] http://www.sinavimo.gov.ar/ (Accessed January 2014)</p> <p>USDA. 2013. Importation of Live Greenhouse-Grown Tomato Plantlets on Approved Growing Media from Mexico into the Continental United States. A Qualitative, Pathway-Initiated Pest Risk Assessment. December 23, 2013 Version 2. Available at http://www.aphis.usda.gov/import_export/plants/plant_imports/process/downloads/Mexico%20tomato%20transplants%20in%20AGM%20RA_12-23-2013.pdf. (Accessed January 2014)</p> <p>Vreugdenhil D, Bradshaw J, Gebhardt C, Govers F, Taylor MA, MacKerron DKL, Ross HA. 2011. Potato Biology and Biotechnology: Advances and Perspectives. Elsevier, 856 pages</p>