Netherlands Food and Consumer
Product Safety Authority
Ministry of Agriculture,
Nature and Food Quality

Quick scan for *Euscepes batatae (Waterhouse, 1850)*

National Plant Protection Organization, the Netherlands

Quick scan number: **QS2022ENT001**

Quick scan date: 12 January 2022

No.	Question	Quick scan answer for ***Euscepes batatae***
1.	What is the scientific name (if possible up to species level + author, also include (sub)family and order) and English/common name of the organism? *Add picture of organism/damage if available and publication allowed*.	*Euscepes batatae* (Waterhouse, 1850) (Insecta, Coleoptera) Synonyms: *Euscepes postfasciatus (Fairmaire, 1849)* *Cryptorhynchus batatae* (Waterhouse, 1850) *Hyperomorpha squamosa* Blackburn, 1885 In literature, the name *E. postfasciatus* is used most frequently. However, *Euscepes batatae* Waterhouse appears to be senior synonym (Sherman & Tamashiro 1954) and is therefore used in the quickscan.

No.	Question	Quick scan answer for *Euscepes batatae*
		 **a)** Adult specimen (foto: Juliana Cardona-Duque, University of Puerto Rico, Bugwood.org)  **b)** Galleries in sweet potato produced by larvae of West Indian sweetpotato weevil. (foto: Whitney Cranshaw, Colorado State University, Bugwood.org)  **c)** Pupae within sweet potato. (foto: Whitney Cranshaw, Colorado State University, Bugwood.org)
2.	What prompted this quick scan? *Organism detected in produce for import, export, in cultivation, nature, mentioned in publications, e.g. EPPO alert list, etc.*	An infested consignment of sweet potatoes (*Ipomoea batatas*) from Surinam was intercepted during import inspection from which a larval specimen was subsequently identified.
3.	What is the current area of distribution?	The species likely originates from the Caribbean and has been introduced into South America, the Pacific, Oceania and Japan (Okinawa and the Amami Islands) (Anonymous 1994, Gurr et al. 2016; Johnson and Gurr 2016, Brookes et al. 2019, EPPO 2020, dos Santos et al. 2021). Its current distribution includes: - Asia: Japan (Okinawa (Okinawa prefecture) and the Amami Islands (Kagoshima prefecture)); - Pacific & Oceania: Cook islands, Fiji, French Polynesia, Kiribati, Mariana Islands (Guam, Northern Mariana Islands), New Caledonia, Norfolk Island, Papua New Guinea, Pitcairn, Samoa, Tonga, Vanuatu, Wallis and Futuna, Hawaii; - Caribbean islands: Antigua, Barbados, Cuba, Dominican Republic, Grenada, Guadeloupe, Haiti, Jamaica, Martinique, Montserrat, Puerto Rico, St. Kitts and Nevis, St. Lucia, St. Vincent, Trinidad and Tobago, Virgin Islands; - South America: Brazil (Amazonas, Bahia, Ceará, Espirito Santo, Guanabara, Minas Gerais, Pará, Paraibá, Rio de Janeiro, Rio Grande do Norte, Santa Catarina, Sao Paulo), French Guiana, Guyana, Paraguay, Peru, Surinam, Venezuela (Anonymous 1994, Brookes 2019, EPPO, 2020).
4.	What are the hostplants?	The species is primarily associated with sweet potato (*Ipomoea batatas*), which is the preferred host plant (Alleyne 1982). There are records that *E. batatae* can develop on wild relatives of sweet potato, such as *I. pes-caprae*, *I. spiralis*, *I. nil* and *I. tiliacea* (Sherman & Tamashiro 1954, Alleyne 1982). However, infestation levels, growth rates and survival on these plants are lower than on *I. batatas* (Alleyne 1982). During an outbreak in Kaboshima in Japan, weevils were found at 46 cultivation sites of *I. batatas* but also at four growing sites of blue morning glory (*Ipomoea indica*) (Nishioka et al. 2014). Besides these congeneric host

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		plants, Anonymous (2022a) mentions additional unrelated hosts species such as *Daucus carota* (carrot) and *Raphanus sativus* (radish). Listing of these species as hosts is likely based on Muruvanda et al. (1986). Muruvanda et al. (1986) conducted no-choice bioassays with *Daucus carota* and *Raphanus sativus.* They observed feeding of adults on both plant species but oviposition only occurred in carrot. Eggs that were laid in the presence of *R. sativus* were not on the plant but on the jar. There was no successful larval development observed on either of the plant species and these alternative food plants therefore likely support adult survival only (Muruvanda et al. 1986). Thus, there is no evidence that *E. batatae* can complete its life cycle in *D. carota* and *R. sativus* and these plant species are not listed as hosts in the current risk assessment.
5.	Does the organism cause any kind of plant damage in the current area of distribution and/or does the consignment demonstrate damage suspected to have been caused by this organism? *Yes/no + plant species on which damage has been reported + short description of symptoms.* *Please indicate also when the organism is otherwise harmful (e.g. predator, human/veterinary pathogen vector, etc.).*	*E. batatae* is an important pest of sweet potato in Japan, the Pacific, Caribbean basin and in some South American countries (Alleyne, 1982, dos Santos et al. 2021). Adults lay their eggs in roots and stems in which larvae tunnel extensively (Alleyne 1982, Fatiaki 2017, Johnson and Gurr 2016). In the Caribbean and in Japan, the weevil causes extensive damage to roots both in the field and in storage (Alleyne 1982, Yasuda 1997a, Anonymous 2022b). In Japan, the weevil is the most serious pest of sweet potato in the Ryukyu Islands (Anonymous 2022ab). Fielding & Van Crowder (1995) reported that 92% of the surveyed Jamaican farmers suffered crop damage in sweet potatoes by weevils (*Euscepes batatae* and *Cylas formicarius* pooled). Moreover, weevil feeding induces sweet potato roots to produce furano-terpenoids making already slightly damaged roots unsuitable for consumption (Jansson 1992, Anonymous 2022a). Therefore proportions of damaged produce strongly correlates with the proportion of unusable product, because low levels of damage will lead to the rejection of the product.
6.	Assess the probability of establishment in the Netherlands (NL) (i.e. the suitability of the environment for establishment). a. In greenhouses b. Outdoors c. Otherwise (e.g. storage facilities, human environment)	Unlikely. The main host (*I. batatas*) is present in a very limited area in NL, approximately 20 ha in 2018 (Agrio 2021). Alternative hosts (other *Ipomoea* spp. such as morning glory varieties and perhaps *Daucus carota* but see 4.) may be present outdoors but the environmental conditions make establishment of this (sub)tropical species unlikely (see 7).
7.	Assess the probability of establishment in the EU (i.e. the suitability of the environment for establishment).	The current distribution of *E. batatae* is limited to tropical and subtropical areas and the species may be able to establish in southern parts of the EU. The area of sweet potato production is limited in (southern) EU but its importance seems to increase (Table 1, Mulderij 2017). According to Shimoji (2011), the developmental zero of *E. batatae* is between 11 and 12°C. Full development is observed in the range of 22°C to 31°C, with an optimum between 25°C and 28°C. No data on lethal minimum temperature has been found. The thermal constant for development was 769.2 degree-days above 11°C (Shimoji 2011). Nishioka et al. (2014) mentions that in Japan, tuber storage silos may provide a refuge for the weevil to overwinter under less suitable conditions. Establishment of this (sub)tropical species seems less likely in cooler regions in the EU because of unfavorable climatic conditions and absence or limited cultivation areas of the main host plant *I. batatas*. The uncertainty of this assessment is 'medium'. More information is needed on cropping practices in the EU including production of sweet potato under protected conditions, survival of *E. batatae* in absence of

<table>
<tr><th>No.</th><th>Question</th><th>Quick scan answer for Euscepes batatae</th></tr>
<tr><td></td><td></td><td>the main host plant (sweet potato) and tolerance of the weevil for low temperatures to assess its potential for establishment in the EU with higher confidence.

Table 1. Sweet potato area harvested in four EU member states in 2017 (source Faostat, retrieved on 2022-01-10; no data available from more recent years)
<table>
<tr><th>EU-member state</th><th>Area harvested (ha)</th></tr>
<tr><td>Greece</td><td>90</td></tr>
<tr><td>Italy</td><td>388</td></tr>
<tr><td>Portugal</td><td>954</td></tr>
<tr><td>Spain</td><td>2145</td></tr>
</table></td></tr>
<tr><td>8.</td><td>What are the possible pathways that can contribute to spread of the organism after introduction? How rapid is the organism expected to spread (by natural dispersal and human activity)?</td><td>Unlike in Solanum tuberosum, which is propagated using tubers only, propagation of sweet potato takes place using vine, root slips or storage roots (Loebenstein 2009). The most important dispersal pathway is the movement of different propagation materials (slips, cuttings or vines and tubers) that have been infested by E. batatae (Alleyne 1982, Nishioka et al. 2014). Larvae may develop in both tubers and stems (vines) where their presence is more difficult to notice at low infestation levels (Fatiaki 2017). Thus, eggs, larvae, pupae and adults may be present in stems and roots (CABI 2021). Infestations of stems and tubers of I. batatas have been observed in Samoa and in Japan (Fatiaki et al. 2017, Yasuda 1997a, Yasuda 1997b). In addition, weevils may cling to clothes and spread by workers moving between fields Alleyne (1982). The species may also be spread by trade of tubers not intended for planting as shown by the interception (see 2). Although adults of E. batatae have wings, they have not been observed to fly (Alleyne 1982, Gurr et al. 2016, Johnson and Gurr 2016).</td></tr>
<tr><td>9.</td><td>Provide an assessment of the type and amount of direct and indirect damage (e.g. lower quality, lower production, export restrictions, threat to biodiversity, etc.) likely to occur if the organism would become established in NL and the EU, respectively?</td><td>Reduction in yield and product quality (see 5).</td></tr>
<tr><td>10.</td><td>Has the organism been detected on/in a product other than plants for planting (e.g. cut flowers, fruit, vegetables)?
If “no”, go to question 12</td><td>Yes</td></tr>
<tr><td>11.</td><td>If the organism has been found on/in a product other than plants for planting (e.g. cut flowers, fruit, vegetables), what is the probability of introduction (entry + establishment)?
Only to be answered in case of an interception or a find.</td><td>The probability of introduction seems very low because the product will generally be stored indoors after it will be consumed. Infested tubers may be discarded by the consumer and placed in a waste bin. Infested tubers that are being imported may already contain adults. Otherwise, immature stages may develop into adults before the tubers are consumed or destroyed by composting or incineration. Adults may escape from the storage room or waste bin, find a suitable host and initiate a population. Generally, the probability that this will happen seems very low: the climatic conditions are unfavourable for population development in the</td></tr>
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		larger part of the PRA area (EU) and in most of the PRA area during winter time, adults do not fly and the main host plant, *I. batatas*, is grown on a limited scale.
12.	Additional remarks	Trapping of adults for detection is possible. Nakamoto and Takushi (2002) developed LED traps that may be used as alternatives to baited traps. Pesticides are ineffective in elimination. When feasible, exposing infested consignments to a dose of 15 Gy gamma radiation proved sufficient to provide quarantine security (Follett 2007). Another economically important sweet potato weevil is *Cylas formicarius* that has been found on sweet potato on several earlier occasions in the Netherlands. It has been intercepted during import inspection on *I. batatas* in 2012 (EPPO 2012). On two separate occasions, *C. formicarius* has been found on sweet potatoes at a retailer in 2020.
13.	References	Agrio 2021. Zoete bataat zoekt plek op Nederlandse akker. https://www.akkerwijzer.nl/artikel/139759-zoete-bataat-zoekt-plek-op-nederlandse-akker/ Alleyne EH 1982. Studies on the biology and behavior of the West Indian sweet potato weevil, Euscepes postfasciatus (Fairmaire) (Coleoptera: Curculionidae). Eighteen Annual Meeting of the Caribbean Food Crops Society. Dover Convention Centre Barbados. 18, 236-243. Anonymous 1994. Euscepes postfasciatus. Distribution Maps of Plant Pests, CAB International, UK, DOI 10.1079/DMPP/20046600309, Record Number 20046600309. https://www.cabi.org/ISC/abstract/20046600309 Anonymous 2022a. West Indian sweet potato weevil Euscepes postfasciatus https://www.plantwise.org/knowledgebank/datasheet/23541#DistributionSection Anonymous 2022b. Asian-Pacific Alien Species Database (APASD) http://www.naro.affrc.go.jp/archive/niaes/techdoc/apasd/Euscepes%20postfasciatus%20-B.html Brookes DR, Hereward JP, Walter GH, Furlong MJ 2019. Origins, Divergence, and Contrasting Invasion History of the Sweet Potato Weevil Pests Cylas formicarius (Coleoptera: Brentidae) and Euscepes batatae (Coleoptera: Curculionidae) in the Asia-Pacific. J. Econ. Entomol. 112, 2931-2939. CABI 2021. Datasheet Euscepes postfasciatus (West Indian sweet potato weevil). Available online: https://www.cabi.org/isc/datasheet/23541#toplantTrade [Accessed 11-01-2022]. dos Santos MM, dos Santos Cabral MJ, Faustino Jr. W, da Silva IM, da Costa MR and Alvarenga Soares M 2021. Occurrence of Euscepes postfasciatus (Coleoptera: Curculionidae) in Ipomoea batatas in Diamantina, Minas Gerais, Brazil. Arq. Inst. Biol. v.88, 1-4, e00182020 EPPO 2012. Pests newly found or intercepted in the Netherlands. EPPO Reporting Service no. 02 - 2012 Num. article: 2012/037. https://gd.eppo.int/reporting/article-1864 EPPO, 2020. Euscepes postfasciatus, distribution. Available online : https://gd.eppo.int/taxon/EUSPPO/distribution [Accessed: 10-01-2022] Fatiaki FA, Palomar MK and Furlong M 2017. Abundance and distribution of West Indian sweet potato weevil, Euscepes batatae (Waterhouse) (Coleoptera: Curculionidae), in Samoa. Journal of South Pacific Agriculture. 20, 16-24.

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		Fatiaki FA 2017. Abundance, within-vine distribution and oviposition site preferences of Euscepes batatae (Waterhouse) (Coleoptera: Curculionidae) in sweet potato cultivars in Samoa. M.Sc. Thesis. The University of the South Pacific. pp. 96 Fielding WJ, Van Crowder L 1995. Sweet-Potato Weevils In Jamaica - Acceptable Pests. J. Sustain. Agric. 5, 105-117. Follett PA 2006. Irradiation as a methyl bromide alternative for postharvest control of Omphisa anastomosalis (Lepidoptera : Pyralidae) and Euscepes postfasciatus and Cylas fornficarius elegantulus (Coleoptera : Curculionidae) in sweet potatoes. J. Econ. Entomol. 99, 32-37. Gurr GM, Liu J, Johnson AC, Woruba DN, Kirchhof G, Fujinuma R, Sirabis W, Jeffery Y, Akkinapally R 2016. Pests, diseases and crop protection practices in the smallholder sweetpotato production system of the highlands of Papua New Guinea. PeerJ. 4:e2703; DOI 10.7717/peerj.2703 Jansson RK 1992. Biological Approaches For Management Of Weevils Of Root And Tuber Crops - A Review. Fla. Entomol. 75, 568-584. Johnson AC, Gurr GM 2016. Invertebrate pests and diseases of sweetpotato (Ipomoea batatas): a review and identification of research priorities for smallholder production. Ann. Appl. Biol. 168, 291-320. Loebenstein, G., 2009. Origin, distribution and economic importance. The sweetpotato, pp.9-12. Mulderij R 2017. Overzicht wereldmarkt zoete aardappel. https://www.agf.nl/article/165825/overzicht-wereldmarkt-zoete-aardappel/ Muruvanda DA, Beardsley AJ and Mitchell WC 1986. Additional Alternate Hosts of the Sweetpotato Weevils Cylas formicarius elegantulus and Euscepes postfasciatus (Coleoptera: Curculionidae) in Hawaii. Proceedings, Hawaiian Entomological Society. 26, 93-96. Nakamoto Y, Takushi J 2002. A newly developed LED (light emitting diode) trap for the west Indian sweet potato weevil, Euscepes postfasciatus (Fairmaire) (Coleoptera : Curculionidae). Jpn. J. Appl. Entomol. Zool. 46, 145-151. Nishioka K, Sakamaki Y, Nakamura T, Yamaguchi T 2014. Spatio-epidemiological and Risk Analysis of Factors Leading to the Establishment of an Invading Population of the West Indian Sweet Potato Weevil in Ibusuki City, Kagoshima Prefecture, Japan. Jpn. J. Appl. Entomol. Zool. 58, 237-247. Sherman M and Tamashiro M 1954. The sweet potato weevils in Hawaii, their biology and control. Hawaii Agricultural Experiment Station, University of Hawaii. pp 36. Shimoji Y 2011. Effect of temperature on the development of the West Indian sweet potato weevil, Euscepes postfasciatus (Fairmaire) (Coleoptera: Curculionidae) on an artificial diet. Appl. Entomol. Zoolog. 46, 51-54. Yasuda K 1997a. Control threshold on sweet potato, Ipomoea batatas L., damaged by the West Indian Sweet Potato Weevil, Euscepes postfasciatus (Fairmaire) (Coleoptera: Curculionidae). Jpn. J. Appl. Entomol. Zool. 41, 201-207. Yasuda K 1997b. Occurrence of West Indian sweet potato weevil, Euscepes postifasciatus (Fairmaire) (Coleoptera:Curculionidae) and damage to sweet-potato (Ipomoea batatas (L) Lam) fields. Jpn. J. Appl. Entomol. Zool. 41, 83-88.

14.	**Conclusions**	This Quickscan was prompted by the interception of *Euscepes batatae* (synonym: *E. postfasciatus*) in tubers of sweet potato (*Ipomoea batatas*). *E. batatae* is not known to be present in the EU. It may be able to establish in parts of southern EU. The probability of introduction (entry + establishment) seems, however, very low through import of sweet potatoes that are being consumed. *E. batatae* is expected to cause economic impact in areas where sweet potato is being grown if it were to become established.
15.	**Follow-up measures**	No official measures