Express PRA for *Pyricularia grisea* – Research and Breeding –

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Initiation: Application for an Express-PRA by the Federal State North-Rhine Westphalia resulting from a request for a special authorisation for the movement and use of the organism for research and breeding purposes.

Express PRA	***Pyricularia grisea* Cooke ex Sacc., 1886**		
Phytosanitary risk for Germany	**high** ☐	**medium** ☐	**low** ☒
Phytosanitary risk for EU Member States	**high** ☐	**medium** ☐	**low** ☒
Certainty of the assessment	**high** ☐	**medium** ☒	**low** ☐
Conclusion	According to current knowledge, the tropical fungus *Pyricularia grisea* is not present in Germany. The literature points to one historic evidence in the EU (Romania). So far, it is listed neither in the Annexes of of the Regulation (EU) 2019/2072 nor by EPPO. Finger millet (*Digitaria* sp.) was detected as a host plant for *P. grisea*. Further indications in respect to other host plants as rice, maize, soybean and wheat could be attributed to the equation with the sister species *Pyricularia oryzae* (*Magnaporthe oryzae*). However, a broader host plant range of *P. grisea* cannot be ruled out. Due to inappropriate climatic conditions, it is assumed that *P. grisea* cannot establish outdoors in Germany. The establishment in EU Member States is possible wherever *P. oryzae* is already present. Host plants of *P. grisea* are not grown in protected cultivation. Due to the low damage potential on species of finger millet that are not commercially used, *P. grisea* poses no phytosanitary risk for Germany and a low phytosanitary risk for other EU Member States. Thus, *P. grisea* is not classified as a potential quarantine pest and Article 29 of the Regulation (EU) 2016/2031 does not apply. However, host plants are widely distributed in Germany and Europe, a broad host range cannot be completely ruled out and so far, the fungus is not established. Measures for the prevention of the release should be recommended, including the application of the good laboratory practices like the inactivation of the pathogen after completion of the trials.		
Preconditions for Express-PRA fulfilled?	Could be a pest, is not listed; so far, it is not established in the area covered by the reporting plant protection service.		

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Taxonomy, common name, synonyms	Kingdom: Fungi; Strain: Ascomycota; Class: Sordariomycetes; Order: Magnaporthales; Family: Pyriculariaceae; Genus: *Pyricularia*; Species: *Pyricularia grisea* Cooke ex Sacc., 1886 Synonyms (anamorph): *Ceratosphaeria grisea* T.T. Hebert, 1971; *Dactylaria grisea* (Cooke ex Sacc.) Shirai, 1910; Synonyms (teleomorph): *Magnaporthe grisea* (T. T. Hebert) M. E. Barr, 1977; *Phragmoporthe grisea* (T. T. Hebert) M. Monod, 1983
Does a relevant earlier PRA exist?	No, only one risk assessment of the Federal Office of Consumer Protection and Food Safety (BVL) as donor and recipient organism for genetic engineering (BVL, 2008) is available (see below.)
Distribution and biology	Brazil, India, Japan, Philippines (ZELLERHOFF et al., 2006). Herbarium sheets of the IMI (International Mycological Institute) of *Digitaria* spp. with *P. grisea* are available from Oceania (Australia, Fiji, Papua New Guinea), great parts of Africa (Guinea, Tanzania, Sudan, Egypt, Ghana, Kenya, Zambia, Zimbabwe), South and Central America (Venezuela, Puerto Rico, Dominican Republic, Cuba), Asia (Malaysia, Myanmar, Hong Kong), North America (Canada, USA) and Europe (Rumania) (LENNÉ, 1990). The biology of *P. grisea* corresponds to that of *P. oryzae*. For the germination of the conidiospores and the infection of the plants, the fungus needs an ongoing phase of high air humidity (> 90 %) and temperatures of 26 – 28 °C. The hyphae colonize the cells at the penetration site and neighbouring cells that are dying. Due to the dead plant cells and the mycelium, leaf spots develop on the leaf surface (BVL, 2008).
Are host plants present in the PRA area? If so, which?	The fungus can be isolated from finger millet (*Digitaria* sp.) (BVL, 2007; ZELLERHOF et al., 2006). In Germany and Europe, three species of finger millet are present as wild herbs. In Germany, mainly smooth crabgrass (*D. ischaemum*) and hairy crabgrass (*D. sanguinalis*) are present almost nationwide (BFN, 2013).
Is a vector/further plant needed for host alternation? Which? Distribution?	No
Climate in the distribution area comparable to PRA area?	For its distribution, the fungus needs long lasting warm and humid conditions. The climatic requirements of *P. grisea* are equal to those of *P. oryzae* (BVL, 2008). *P. oryzae* is already distributed in southern Europe in Bulgaria, France, Greece, Hungary, Italy, Portugal, Romania and Spain (EPPO, 2019).

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If no, are host plants present in protected cultivation?	No
Damage to be expected in the PRA area?	*Pyricularia grisea* causes leaf spots on *Digitaria* sp. and chlorotic colouring of the leaves. In Europe, *Digitaria* sp. is not used commercially and mostly is seen as an unwanted weed. Under the current climatic conditions, no damage by *P. grisea* is expected in natural stands of *Digitaria* sp in Germany. In warm and humid European regions, damage is possible on natural *Digitaria*-stands.
Remarks	In case of movement and use of the organism, a release must be prevented. According to the Ordinance on Safety Levels and Safety Measures for Genetic Engineering in Genetic Engineering facilities [Verordnung über die Sicherheitsstufen and Sicherheitsmaßnahmen bei gentechnischen Arbeiten in gentechnischen Anlagen (GenTSV)] and the Federal Office of Consumer Protection and Food Safety (2007), the fungus is classified as donor and recipient organism for genetic engineering and belongs to the risk group 1. Formerly, *Pyricularia grisea* and *P. oryzae* were listed as one species under the name *Magnaporthe grisea* (or *P. grisea*). In current literature, the names partly are used synonymously. Due to its significant importance on rice, the literature mostly deals with *P. oryzae*. A distinct allocation to the respective species often is not possible with certainty. Thus, the specific literature was not used for the risk analysis.
Literature	BVL, 2008: Stellungnahme der ZKBS zur Risikobewertung von *Magnaporthe grisea* and *Magnaporthe oryzae* gemäß § 5 Absatz 1 GenTSV (Az: 6790-05-03-43, Mai 2008). Bundesamt für Verbraucherschutz und Lebensmittelsicherheit (Federal Office of Consumer Protection and Food Safety), 2 p. BFN, 2013: FloraWeb Version 1.02. Bundesamt für Naturschutz. http://www.floraweb.de/pflanzenarten/pflanzenarten.html (accessed on: 16-09-2019) COUCH, B.C., L.M. KOHN, 2002: A multilocus gene genealogy concordant with host preference indicates segregation of a new species, *Magnaporthe oryzae*, from *M. grisea*. Mycologia, 94: 683-693. EPPO, 2019: *Pyricularia oryzae*. EPPO Global Database, last update: 16-05-2019. https://gd.eppo.int/taxon/PYRIOR/distribution (accessed on: 17-09-2019) LENNÉ, J. M., 1990: A world list of fungal diseases of tropical pasture species. Phytopathological Paper No. 31, International Mycological Institute, 178 p.

	ZELLERHOFF, N., B. JAROSCH, J. Z. GROENEWALD, P. W. CROUS, U. SCHAFFRATH, 2006: Nonhost resistance of barley is successful manifested against *Magnaporthe grisea* and a closely related *Pennisetum*-Infecting lineage but is overcome by *Magnaporthe oryzae*. Molecular Plant-Microbe Interactions 19(9), 1014-1022.