

Risk Classification of Organisms: Overview of apathogenic organisms other than viruses, bacteria, fungi or parasites, classified by COGEM

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COGEM advice CGM/241210-03

Dutch Regulations Genetically Modified Organisms

In the Decree on Genetically Modified Organisms (GMO Decree) and its accompanying more detailed Regulations (GMO Regulations) genetically modified micro-organisms are grouped in four pathogenicity (PG) classes, ranging from the lowest pathogenicity Class 1 to the highest Class 4.¹ The pathogenicity classifications are used to determine the containment level for working with GMOs.

A micro-organism of Class 1 should at least comply with one of the following conditions:

- a) the micro-organism does not belong to a species of which representatives are known to be pathogenic for humans, animals or plants,
- b) the micro-organism has a long history of safe use under conditions without specific containment measures,
- c) the micro-organism belongs to a species that includes representatives of class 2, 3 or 4, but the particular strain does not contain genetic material that is responsible for the virulence,
- d) the micro-organism has been shown to be non-virulent through adequate tests.

A micro-organism is grouped in Class 2 when it can cause a disease in humans or animals whereby it is unlikely to spread within the population while an effective prophylaxis, treatment or control strategy exists, as well as an organism that can cause a disease in plants.

A micro-organism is grouped in Class 3 when it can cause a serious disease in humans or animals whereby it is likely to spread within the population while an effective prophylaxis, treatment or control strategy exists.

A micro-organism is grouped in Class 4 when it can cause a very serious disease in humans or animals whereby it is likely to spread within the population while no effective prophylaxis, treatment or control strategy exists.

Pathogenicity classification of organisms other than viruses, bacteria, fungi or parasites

The Netherlands Commission on Genetic Modification (COGEM) advises the Dutch government (amongst others) on the classification in risk groups (classes) of organisms according to the risk they

1. Ministerie van Infrastructuur en Milieu. Regeling genetisch gemodificeerde organismen milieubeheer 2013. <https://wetten.overheid.nl/BWBR0035072> [In Dutch]

pose to human health and the environment. These classifications are written in Dutch and are therefore only published on the Dutch part of the COGEM website.

COGEM has published an update on the overview of apathogenic organisms which do not fall under the current categories of bacteria, viruses, fungi and parasites, in Dutch. In order to inform international organisations about the classification of these organisms by COGEM, this overview been translated. The current overview is an update of the previous overview in November 2023, and concerns species that have been advised on since 2000. The organisms are categorized by micro-algae, other single-celled organisms, and multicellular organisms. In the current update, taxonomic revisions have been made, one species COGEM advised on since November 2023 has been added and a link to the corresponding COGEM advice is provided.

Table 1. Overview of classified apathogenic or non-parasitic single celled of multicellular organisms. PC – pathogenicity class.

Phylum	Family	Species	PC	Synonym/basionym	COGEM advice
Micro-algae					
Bigyra	Thraustochytriaceae	<i>Aurantiochytrium limacinum</i> ²	1		CGM/200128-02
Charophyta	Peniaceae	<i>Penium margaritaceum</i>	1		CGM/210120-03
Chlorophyta	<i>Chlamydomonadales familia incertae sedis</i>	<i>Ettlia oleoabundans</i>	1	Syn. <i>Neochloris oleoabundans</i>	CGM/110706-01
	Chlorellaceae	<i>Nannochloris</i> sp. Utex 1999	1		CGM/110706-01
		<i>Prototheca moriformis</i> ³	1		CGM/240221-01
	Chlorodendraceae	<i>Tetraselmis striata</i>	1		CGM/200421-01
	Chromochloridaceae	<i>Chromochloris zofingiensis</i>	1	Basio. <i>Chlorella zofingiensis</i>	CGM/110706-01
	Dunaliellaceae	<i>Dunaliella tertiolecta</i>	1		CGM/110706-01
	Scenedesmaceae	<i>Tetradismus obliquus</i>	1	Syn. <i>Scenedesmus obliquus</i>	CGM/110706-01
	Trebouxiaceae	<i>Lobosphaera incisa</i>	1	Syn. <i>Parietochloris incisa</i>	CGM/110706-01
	Watanabeaceae	<i>Chloroidium ellipsoideum</i>	1	Basio. <i>Chlorella ellipsoidea</i>	CGM/011214-03
		<i>Chloroidium saccharophilum</i>	1	Syn. <i>Chlorella saccharophila</i>	CGM/011214-03
Haptophyta	Isochrysidaceae	<i>Isochrysis galbana</i>	1		CGM/110706-01
Heterokontophyta	Monodopsidaceae	<i>Microchloropsis gaditana</i>	1	Basio. <i>Nannochloropsis gaditana</i>	CGM/160504-01
		<i>Nannochloropsis oceanica</i>	1		CGM/160504-01
	Phaeodactylaceae	<i>Phaeodactylum tricornutum</i>	1		CGM/110706-01
Rhodophyta	Porphyridiaceae	<i>Porphyridium purpureum</i>	1	Syn. <i>Porphyridium cruentum</i>	CGM/110706-01
Other single-celled organisms					
Candidatus Nanohaloarchaeota	-	<i>Candidatus Nanohalarchaeum antarcticum</i>	1		CGM/231023-01
Choanozoa	Salpingoecidae	<i>Salpingoeca rosetta</i>	1		CGM/230626-01
Ciliophora	Tetrahymenidae	<i>Tetrahymena thermophila</i>	1		CGM/190211-03
Evosea (supergroep Amoebozoa)/ Mycetozoa	Acytosteliaceae	<i>Heterostelium pallidum</i>	1	Syn. <i>Polysphondylium pallidum</i>	CGM/210531-01
Thermoproteota	Desulfurococcaceae	<i>Ignicoccus hospitalis</i>	1		CGM/211228-01
Multicellular organisms					
Platyhelminthes	Macrostomidae	<i>Macrostomum hystrix</i>	1		CGM/141204-01
		<i>Macrostomum lignano</i>	1		CGM/101126-01
		<i>Macrostomum pusillum</i>	1		CGM/141204-01
Xenacoelomorpha	Isodiametridae	<i>Aphanostoma pulchra</i>	1	Syn. <i>Isodiametra pulchra</i>	CGM/141204-01

2. There are different views on whether thraustochytrids should be considered micro-algae.

3. COGEM points out that when working with *P. moriformis* strains, it must be confirmed that the strains actually belong to the species *P. moriformis* and are not an incorrectly classified and possibly pathogenic strain. Confirmation can be done by, for example, sequencing and comparison of the cytb gene or ribosomal DNA loci.

