

ADMIN

Strategy Memo: Yeast

EXPERT PANEL MEETING

March 7-8, 2022



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## Memorandum

To: Expert Panel for Cosmetic Ingredient Safety Members and Liaisons  
From: Priya Cherian, Senior Scientific Writer/Analyst  
Date: February 11, 2022  
Subject: Strategy Memo on Yeast-Derived Ingredients

In preparation of the safety assessment on the yeast-derived ingredients, CIR staff found that the definition of the cosmetic ingredient Yeast, as given in the *International Cosmetic Ingredient Dictionary and Handbook*, was extremely broad and uninformative for the purposes of researching this group of cosmetic ingredients in relation to cosmetic safety. According to the *Dictionary*, Yeast (CAS: 68876-77-7) is a class of microorganisms (Saccharomycetes) characterized by a lack of photosynthetic ability, existence as unicellular or simple irregular filaments, and reproduction by budding or direct division. Because the class, Saccharomycetes, pertains to a wide variety of species, and the specific species used in the manufacturing of cosmetic ingredients was unknown, the species, *Saccharomyces cerevisiae* was used for the purposes of this report, based off the reported widespread use of this species in foods, GRAS status, and use as a fermentation agent.

At the September 2021 meeting, the Panel issued an Insufficient Data Announcement (IDA) for this ingredient group, and requested clarification on the species of yeast used in the manufacturing of cosmetic ingredients. Since the issuing of the IDA, chemical/physical properties, manufacturing, dermal, and ocular irritation data on Yeast Extract derived from *Saccharomyces cerevisiae* were received. These data emphasized the use of *Saccharomyces cerevisiae* as the yeast species used in the manufacturing of cosmetic ingredients. However, on February 7, 2022, summary information on Yeast Extract derived from several other yeast species belonging to the class Saccharomycetes (e.g., *Pichia anomala*) were received from the Council. The data received are attached herein (*data\_Yeast\_032022*).

In addition, at the September 2021 meeting, a literature search was requested on two species of yeast ( i.e., *Torula utilis* (also known as *Candida utilis*) and *Saccharomyces fragilis*) which are currently reported to be used in foods, according to the *Food Chemicals Codex*. A search was performed on these species, and data regarding composition, sensitization, fungemia, and infection were found. It should be noted that there is no evidence that these species are being used in cosmetic ingredient manufacturing, as no unpublished data have been received regarding the use of these species in cosmetics.

***The CIR staff is asking the Panel for guidance; in light of the data that have been received, should:***

- 1. this report continue to only review the safety of Saccharomyces cerevisiae-derived yeast ingredients, which would be explained in the document, and only data on Saccharomyces cerevisiae-derived ingredients be included. Or,***
- 2. should data on yeast ingredients derived from other species of yeast of the class Saccharomycetes be included in the document. And if so, should the related Saccharomycetes yeast cosmetic ingredients (e.g., Pichia Anomala Extract) also be included in this assessment.***

When this report was initially undertaken, CIR staff sought guidance from the International Cosmetic Ingredient Nomenclature Committee. Specifically, CIR asked which specific species were used in the manufacturing of these yeast-derived ingredients. The Committee was not able to provide clarity on these points.



**Memorandum**

**TO:** Bart Heldreth, Ph.D.  
Executive Director - Cosmetic Ingredient Review

**FROM:** Carol Eisenmann, Ph.D.  
Personal Care Products Council

**DATE:** February 7, 2022

**SUBJECT:** Yeast Extract

Anonymous. 2022. Summary information - Yeast Extracts.

INCI name	Genus and species	Manufacturing process	Composition	Impurities	Dermal absorption and toxicological data
Yeast Extract	Candida saitoana belongs to the <i>Saccharomyces</i> class	Solubilization of yeast in water, separation of soluble and insoluble phases, filtration and sterile filtration	Sugars: 53% Mineral ashes: 39% Proteins: 7%	The sum of heavy metals is lower than 5 ppm. [ICP-OES]	<p>OCDE 428 : Absorption of 1.1% of the total quantity applied to the surface of the epidermis after 24 hours – study made with an emulsion containing 30% of the ingredient</p> <p>Patch test (10 human volunteers): non irritant</p> <p>HRIPT (112 human volunteers): non sensitizing</p> <p>Studies made on the ingredient at 15% in water</p>
Yeast Extract	Debaryomyces nepalensis belongs to the <i>Saccharomyces</i> class	Solubilization of yeast in water, separation of soluble and insoluble phases, filtration and sterile filtration	Sugars : 45%	The sum of heavy metals is lower than 5 ppm. [ICP-OES]	No data available
Yeast Extract	Metschnikowia reukaufii belongs to the <i>Saccharomyces</i> class	Solubilization of yeast in water, separation of soluble and insoluble phases, filtration and sterile filtration	Proteins : 52% Mineral ashes : 38% Sugars : 10%	The sum of heavy metals is lower than 5 ppm. [ICP-OES]	<p>OCDE 428 : Absorption of 4.6% of the total quantity applied to the surface of the epidermis after 24 hours - study made with an emulsion containing 30 % of the ingredient</p> <p>Patch test(11 human volunteers): non irritant</p>

					<p>HRIPT (104 human volunteers): non sensitizing</p> <p>Studies made on the ingredient at 15% in water</p> <p>KeratinoSens (OCDE 442D) : no sensitizing potential study made on the ingredient</p>
Yeast Extract	Pichia naganishii belongs to the <i>Saccharomyces</i> class	Solubilization of yeast in water, separation of soluble and insoluble phases, filtration and sterile filtration	Proteins : 35%	The sum of heavy metals is lower than 5 ppm. [ICP-OES]	No data available
Yeast Extract	Pichia anomala belongs to the <i>Saccharomyces</i> class	Solubilization of yeast in water, separation of soluble and insoluble phases, filtration and sterile filtration	Sugars: 58 % Proteins :29% Mineral ashes: 13%	The sum of heavy metals is lower than 15 ppm. [ICP-OES]	<p>OCDE 428 : absorption of 0.41% of the total quantity applied to the surface of the epidermis after 24 hours - study made with an emulsion containing 30% of the ingredient</p> <p>Patch test (10 human volunteers): non irritant</p> <p>HRIPT (104 human volunteers): non sensitizing</p> <p>Studies made on the ingredient at 15% in water</p>
Yeast Extract	Pichia anomala belongs to the <i>Saccharomyces</i> class	Solubilization of yeast in water, separation of soluble and	Proteins: 59% Mineral ashes: 35% Sugars: 6%	The sum of heavy metals is lower than 5 ppm. [ICP-OES]	OCDE 428 : Absorption of 0.7% of the total quantity applied to the surface of the epidermis after 24 hours - study

		insoluble phases, filtration and sterile filtration			made with an emulsion containing 30% of the ingredient  Patch test (10 human volunteers): non irritant  HRIPT(100 human volunteers) : non irritant and non sensitizing  Studies made on the ingredient at 15% in water
Yeast Extract	Metschnikowia pulcherrima belongs to the <i>Saccharomyces</i> class	Solubilization of yeast in water, separation of soluble and insoluble phases, filtration and sterile filtration	Proteins 30%	The sum of heavy metals is lower than 10 ppm. [ICP-OES]	Patch test (10 human volunteers): non irritant  Studies made on the ingredient at 15% in water
Yeast Extract	Candida oleophila belongs to the <i>Saccharomyces</i> class	Solubilization of yeast in water, separation of soluble and insoluble phases, filtration and sterile filtration	Proteins : 60%	No data available	No data available
Yeast Extract	Candida magnoliae belongs to the <i>Saccharomyces</i> class	Solubilization of yeast in water, separation of soluble and insoluble phases, filtration and sterile filtration	Sugars :53%	The sum of heavy metals is lower than 20 ppm. [ICP-OES]	Patch test (10 human volunteers): non irritant  Studies made on the ingredient at 15 % in water

<p>Yeast Extract</p>	<p><i>Metschnikowia agaves</i> belongs to the <i>Saccharomyces</i> class</p>	<p>Solubilization of yeast in water, separation of soluble and insoluble phases, filtration and sterile filtration</p>	<p>Sugars : 54% Mineral ashes : 23% Proteins : 23%</p>	<p>The sum of heavy metals is lower than 20 ppm. [ICP-OES]</p>	<p>OCDE 428 : Absorption of 2.4% of the total quantity applied to the surface of the epidermis after 24 hours - study made with an emulsion containing 30% of the ingredient</p> <p>Patch test (11 human volunteers): non irritant</p> <p>HRIPT (112 human volunteers): non sensitizing</p> <p>Studies made on the ingredient at 15% in water</p>
<p>Yeast Extract</p>	<p><i>Pichia heeii</i> belongs to the <i>Saccharomyces</i> class</p>	<p>Solubilization of yeast in water, separation of soluble and insoluble phases, filtration and sterile filtration</p>	<p>Sugars: 64% Mineral ashes: 26% Proteins: 10%</p>	<p>The sum of heavy metals is lower than 5 ppm. [ICP-OES]</p>	<p>OCDE 428 : Absorption of 0.2% of the total quantity applied to the surface of the epidermis after 24 hours - study made with an emulsion containing 30% of the ingredient</p> <p>Patch test (10 human volunteers): non irritant</p> <p>HRPIT (106 human volunteers): non irritant and non sensitizing</p> <p>Studies made on the ingredient at 15% in water</p>
<p>Yeast Extract</p>	<p><i>Pichia minuta</i> belongs to the <i>Saccharomyces</i> class</p>	<p>Solubilization of yeast in water, separation of soluble and insoluble phases, filtration</p>	<p>Sugars: 58% Proteins: 28% Mineral ashes: 14%</p>	<p>The sum of heavy metals is lower than 10 ppm. [ICP-OES]</p>	<p>OCDE 428 : Absorption of 0.6% of the total quantity applied to the surface of the epidermis after 24 hours - study made with an emulsion containing 30% of the ingredient</p>

					Patch test (11 human volunteers): non irritant HRPIT (107 human volunteers): non sensitizing Studies made on the ingredient at 15% in water
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**Remark :** The capacity of our cosmetic ingredients to pass through the skin barrier was studied ex vivo after depositing the ingredient on the surface skin according to OECD Guideline No. 428. The quantity of ingredient having penetrated was quantified by assaying fluorescence in the culture medium.