FACT SHEET

APPLICATION FOR APPROVAL FOR RELEASE OF PRODUCTS OF MON 87429 MAIZE FOR SUPPLY OR OFFER TO SUPPLY FOR SALE OR PLACING IN THE MARKET

NBB REF NO: JBK(S) 600-2/1/24

The objective of the Biosafety Act 2007 is to protect human, plant and animal health, the environment and biological diversity. Under the Biosafety Act 2007, the National Biosafety Board (NBB) is currently assessing an application for approval submitted by Bayer Co. (Malaysia) Sdn. Bhd.

1. What is the application for?

This application is to import and release genetically modified herbicide resistant MON 87429 maize and its products. The application does not cover deliberate environmental release (i.e. cultivation) in Malaysia.

2. What is the purpose of the import and release?

The purpose of the import and release is to supply or offer for sale/ placing on the market for direct use as food, feed and for processing (FFP) of MON 87429 maize. This means that MON 87429 maize may enter Malaysia as grain, food ingredients for processing or packaging or as finished products ready for distribution, or as feed meal for animals. The MON 87429 maize is not intended for cultivation in Malaysia.

3. How has MON 87429 maize been modified?

Genetically modified MON 87429 maize was produced by insertion of *dmo*, *pat*, *ft_t*, and *cp4 epsps* genes into the maize genome using *Agrobacterium*-mediated transformation method to confer tolerance to the herbicides dicamba, glufosinate, aryloxyphenoxypropionate (AOPP) acetyl coenzyme A carboxylase (ACCase) inhibitors (“FOPs” herbicides such as quizalofop) and 2,4-dichlorophenoxyacetic acid (2,4-D). Information on the inserted genes are as follows:

	Gene	Donor organism	Trait
1	*dmo*	*Stenotrophomonas maltophilia*	Tolerance to dicamba herbicide
2	*pat*	*Streptomyces viridochromogenes*	Tolerance to glufosinate herbicide
3	*ft_t* (a modified version of the R-2,4-dichlorophenoxypropionate dioxygenase (*Rdpa*) gene)	*Sphingobium herbicidovorans*	Tolerance to FOPs and 2,4-D herbicides

4	*cp4 epsps*	*Agrobacterium* sp. strain CP4	Tolerance to glyphosate

4. Characteristics of MON 87429 maize

a. Details of the parent organism

The recipient or parental plant is *Zea mays* (maize), also known as corn. Maize has been a staple of the human diet for centuries and is grown in nearly all areas of the globe. It is the largest cultivated crop in the world followed by wheat (*Triticum* sp.) and rice (*Oryza sativa* L.) in total global metric ton production (FAOSTAT, 2020[1]). However, unlike wheat and rice, the majority of maize produced is consumed as animal feed in the form of grain, forage, or silage.

b. Donor organism

Characteristics of *Stenotrophomonas maltophilia*

Stenotrophomonas maltophilia is an aerobic, gram-negative bacterium ubiquitously present in the environment, including in water and dairy products (An and Berg, 2018; Mukherjee and Roy, 2016; Okuno *et al.,* 2018; Todaro *et al.,* 2011). These bacteria have been used as effective biocontrol agents in plant and animal pathogenesis (Mukherjee and Roy, 2016), and have antibacterial activity against both gram-positive and gram-negative bacteria (Dong *et al.,* 2015). These bacteria can form biofilms that become resistant to antibiotics (Berg and Martinez, 2015; Brooke *et al.*, 2017). *S. maltophilia* has been found in healthy individuals without any hazard to human health. Other than the potential to become an opportunist pathogen in immunocompromised hosts, *S. maltophilia* is not known for human or animal pathogenicity (Heller *et al.,* 2016; Lira *et al.*, 2017).

Characteristics of *Streptomyces viridochromogenes*

Streptomyces viridochromogenes is a saprophytic, soil-borne bacterium with no known safety issues. *Streptomyces* species are widespread in the environment and present no known allergenic or toxicity issues (Kämpfer, 2006; Kutzner, 1981), though human exposure is quite common (Goodfellow and Williams, 1983). *S. viridochromogenes* is widespread in the environment and the history of safe use is discussed in Hérouet *et al.* (2005).

Characteristics of *Sphingobium herbicidovorans*

Sphingobium herbicidovorans is a common gram-negative, rod-shaped, non-motile, non-spore-forming soil bacterium (Takeuchi *et al*., 2001; Zipper *et al.,* 1996), which is strictly aerobic and chemo-organotrophic, and not known to be associated with human disease. Members of the genus *Sphingobium* have been isolated from a wide variety of habitats

[1] FAOSTAT. 2020. Food and Agricultural Organization statistical database. Food and Agricultural Organization of the United Nations, Rome, Italy. http://www.fao.org/faostat/en/#data/QC [Accessed June 03, 2020].

including soil and freshwater (Chaudhary *et al.,* 2017). *Sphingobium* species have also been isolated from food products such as maize (Rijavec *et al.*, 2007), papaya (Thomas *et al*., 2007) and tomato (Enya *et al.,* 2007). The biosysthesis and biodegrading properties of this genus have been exploited in the food industry (Fialho *et al.,* 2008; Pozo *et al.,* 2007), bioremediation (Alarcón *et al.,* 2008; Jin *et al.,* 2013), and biofuel industry (Varman *et al.,* 2016).

Characteristics of *Agrobacterium tumefaciens* strain CP4

Agrobacterium tumefaciens strain CP4 is the source of the *cp4 epsps* gene. *Agrobacterium sp*. is a gram-negative, motile, soil-dwelling plant pathogen. *Agrobacterium* species are not known for human or animal pathogenicity and are not commonly allergenic (FAO-WHO, 2001).

c. Description of the trait(s) and characteristics which have been introduced or modified

MON 87429 maize contains *dmo*, *pat*, *ft_t*, and *cp4 epsps* genes that expresses DMO, PAT , FT_T and CP4 EPSPS proteins, respectively that confer tolerance to the herbicides dicamba, glufosinate, FOPs, 2,4-D and glyphosate.

d. Safety of the expressed proteins

Information and data from studies demonstrate that the DMO, PAT , FT_T and CP4 EPSPS proteins are unlikely to be allergens or toxins or other biologically active proteins. This is based on the assessment of the donor organisms, *Stenotrophomonas maltophilia* strain DI-6, *Streptomyces viridochromogenes, Sphingobium herbicidovorans* and *Agrobacterium tumefaciens* strain CP4 which are not known for human or animal toxicity, and are not commonly allergenic (Heller *et al.,* 2016; Lira *et al.,* 2017; Kämpfer, 2006; Takeuchi *et al.,* 2001; Chaudhary *et al*., 2017; FAO-WHO, 2001). Bioinformatics analysis was used to compare the DMO, PAT , FT_T and CP4 EPSPS amino acid sequences against known allergens and toxins and other biologically active proteins and the results showed a lack of significant structural similarity between the DMO, PAT , FT_T and CP4 EPSPS proteins and known allergens or toxins or other biologically active proteins (Gu *et al.,* 2018; Vest and Silvanovich, 2018; Skottke and Silvanovich, 2018). In addition, studies using the DMO, PAT , FT_T and CP4 EPSPS proteins have demonstrated that the proteins were digested rapidly in simulated digestive fluids (Gu, 2018; Chen and Wang, 2019; Calcaterra, 2018; Leach *et al.,* 2002), and ingestion of the proteins did not cause acute toxicity in mice (Smedley, 2012a; Smedley, 2012b; Good, 2018; Naylor, 1993). These data support the safety for DMO, PAT , FT_T and CP4 EPSPS proteins.

e. Utilization of maize

Maize has been a staple of the human diet for centuries, and its processed fractions are consumed in a multitude of food and animal feed products. Food uses of maize include processed products from field maize and direct consumption of sweet maize and popcorn. Food products derived from the wet milling process include starch and sweetener products (e.g., high fructose maize syrup) (May, 1987). Food products derived from the dry milling

process include maize grits, maize meal, and maize flour (Watson, 1988). Maize oil may be derived from either milling process (Watson, 1988).

Maize is used extensively as a livestock feed for reasons that include its palatability, digestibility, and metabolizable energy (Loy and Lundy, 2019). Animal feed products include maize gluten feed, maize gluten meal, and hominy feed (Loy and Lundy, 2019). Ethanol production from dry milled maize provides distillers grains, another source of animal feed (Loy and Lundy, 2019). Maize can also be fed as a whole plant silage.

MON 87429 maize may enter Malaysia as grain, food ingredients for processing or packaging or as finished products ready for distribution, or as feed meal for animals.

5. Assessment of risks to human health

a. Nutritional data

Data obtained from compositional analyses conducted on the grain and forage of MON 87429 maize showed that there were no statistically significant differences in 50 of the 61 comparisons made between MON 87429 and conventional control. A statistically significant difference between MON 87429 and the conventional control does not necessarily imply biological relevance from a food and feed safety perspective. Therefore the 11 components that showed statistically significant difference were evaluated further (assessments related to comparisons to natural variations) to determine whether the detected difference indicated a biologically relevant compositional change. The mean values for the 11 components were found to be within the natural variability of these components as published in scientific literature and the ILSI Crop Composition Database (ILSI-CCDB)(Klusmeyer *et al.,* 2018) and could be due to normal biological variability that exist in corn. Therefore, these statistically significant differences are not considered biologically relevant. This data supports the statement that MON 87429 maize is compositionally equivalent to conventional maize.

Detailed information on the composition analysis may be obtained from the Department of Biosafety.

b. Toxicology

There are no known health hazards associated with the product. Studies conducted using the DMO, PAT , FT_T and CP4 EPSPS proteins produced in MON 87429 have shown no toxicity toward mammals (Smedley, 2012a; Smedley, 2012b; Good, 2018; Naylor, 1993). Additionally, there are no amino acid sequences similarities of MON 87429 maize to known toxins or other biologically active proteins that would raise a safety concern for human (Gu *et al.*, 2018; Vest and Silvanovich, 2018; Skottke and Silvanovich, 2018).

Detailed information on the toxicology studies may be obtained from the Department of Biosafety.

c. Allergenicity

Stenotrophomonas maltophilia, Streptomyces viridochromogenes, *Sphingobium herbicidovorans* and *Agrobacterium tumefaciens* strain CP4 are ubiquitous in the environment and have lack of reports of allergies derived from the organisms (Mukherjee and Roy, 2016; An and Berg, 2018; Todaro et al., 2011; Kämpfer, 2006; Kutzner, 1981; FAO-WHO, 2001). The opportunistic pathogenicity of *S. maltophilia* is mainly associated with individuals with compromised immune systems rather than with any specific virulence genes of these bacteria. Thus, documented occurrences of *S. maltophilia* infections have been limited to immunocompromised individuals in hospital settings (Lira *et al.,* 2017). *S. viridochromogenes* is widespread in the environment and the history of safe use is discussed in Hérouet *et al.* (2005). The ubiquitous presence of *Sphingobium* species in the environment has resulted in widespread human and animal exposure without any known adverse safety or allergenicity reports. The *Agrobacterium tumefaciens* strain CP4 has a demonstrated history of safe use with the first product commercialized in 1996 (ILSI-CERA, 2010).

Detailed information on the allergenicity studies may be obtained from the Department of Biosafety.

6. Assessment of risks to the environment

The application does not cover an environmental release. The application is intended only to cover the import of MON 87429 maize products from countries where MON 87429 maize is already approved and commercially grown, and that may enter Malaysia as grain, food ingredients for processing or packaging or as finished products ready for distribution, or as feed meal for animals. Thus, the potential exposure to the environment is limited to spillage events. On environmental risk assessment of genetically engineered (GE) plants under low-exposure conditions, the loss of imported seeds are most likely to occur near ports or along roads from ports to manufacturing sites (Roberts *et al.,* 2014). Most of the spilled seeds are unlikely to survive for long outside intentional cultivation by the following limiting factors:

i) seeds not encountering conditions favorable for germination;
ii) the plants germinated in the areas which are often managed (e.g. mowing, cleaning);
iii) poor competitive ability with native vegetation, maize is not an indigenous species (OECD, 2000), and is not a major economic crop in Malaysia.

Therefore, MON 87429 maize is unlikely to germinate and establish upon accidental spillage in Malaysia.

7. What is the emergency response plan?

MON 87429 maize and food and feed products derived from it have been assessed as being as safe as its conventional non GE counterparts. Should adverse effects be reported and verified, appropriate follow up actions would be taken.

a. First aid measures

No special first aid measures are required in response for exposure to this product.

b. Accidental release measures

No special measures are required in response to an accidental release. Spilled seeds should be swept, scooped or vacuumed in a manner that avoids dust generation and dust-related hazards.

c. Handling and storage

No special handling and storage procedures are required for this product. MON 87429 maize and its products may be handled and stored as any conventional maize products.

d. Disposal considerations

The same measures for waste disposal and treatment as for conventional maize are valid for MON 87429 maize.

8. How can I comment on this application?

Any member of the public may submit their comments or queries on publicly notified information about the application. Before submission of comments or queries, the person should review the information provided. Your comments or queries on any possible impacts/risks to the health and safety of the people and the environment that may be posed by the proposed release are appreciated. The submission of the comments or queries should be prepared carefully as it will be given the same scrutiny as the application by the NBB. The submission of comments and clarifications of queries should contribute to the NBB's assessment. Even if the submission is not science-based, and focuses on cultural or other values, it should still be developed in the form of a well-founded argument.

Please note that the consultation period closes on 15 March 2022 and written submissions are required by that date. Submissions must be addressed to:

Director General,
Department of Biosafety
Ministry of Environment and Water
Level 4, Block F11, Complex F
Lebuh Perdana Timur, Precinct 1
Federal Government Administrative Centre
62000 Putrajaya, MALAYSIA
E-mail: dob@biosafety.gov.my

Please include your full name, address and contact details in your submission.

References

Alarcón, A., F.T. Davies, R.L. Autenrieth and D.A. Zuberer. 2008. Arbuscular mycorrhiza and petroleum-degrading microorganisms enhance phytoremediation of petroleum-contaminated soil. International Journal of Phytoremediation 10:251-263.

An, S.-q. and G. Berg. 2018. *Stenotrophomonas maltophilia*. Trends in Microbiology 26:637-638.

Berg, G. and J.L. Martinez. 2015. Friends or foes: Can we make a distinction between beneficial and harmful strains of the *Stenotrophomonas maltophilia* complex? Frontiers in Microbiology 6:241.

Brooke, J.S., G. Di Bonaventura, G. Berg and J.-L. Martinez. 2017. Editorial: A multidisciplinary look at *Stenotrophomonas maltophilia*: An emerging multi-drug-resistant global opportunistic pathogen. Frontiers in Microbiology 8:1511.

Calcaterra, J. 2018. Assessment of the in vitro Digestibility of *Escherichia coli* (*E. coli*)-produced FT_T Protein by Pepsin and Pancreatin. Monsanto Technical Report MSL0029802. St. Louis, Missouri.

Chaudhary, D.K., S.-W. Jeong and J. Kim. 2017. *Sphingobium naphthae* sp nov., with the ability to degrade aliphatic hydrocarbons, isolated from oil-contaminated soil. International Journal of Systematic and Evolutionary Microbiology 67:2986-2993.

Chen, B. and C. Wang. 2019. Assessment of the *in vitro* Digestibility of Phosphinothricin N-Acetyltransferase Protein by Pepsin and Pancreatin. Monsanto Technical Report MSL0030203. St. Louis, Missouri.

Dong, H., C. Zhu, J. Chen, X. Ye and Y.-P. Huang. 2015. Antibacterial activity of *Stenotrophomonas maltophilia* endolysin P28 against both gram-positive and gram-negative bacteria. Frontiers in Microbiology 6:1299.

Edgerton, M.D. 2009. Increasing crop productivity to meet global needs for feed, food, and fuel. Plant Physiology 149:7-13.

Enya, J., H. Shinohara, S. Yoshida, T. Tsukiboshi, H. Negishi, K. Suyama and S. Tsushima. 2007. Culturable leaf-associated bacteria on tomato plants and their potential as biological control agents. Microbial Ecology 53:524-536.

FAO-WHO. 2001. Evaluation of allergenicity of genetically modified foods. Report of a joint FAO/WHO expert consultation on allergenicity of foods derived from biotechnology. Food and Agriculture Organization of the United Nations, Rome, Italy.

Fialho, A.M., L.M. Moreira, A.T. Granja, A.O. Popescu, K. Hoffmann and I. Sá-Correia. 2008. Occurrence, production, and applications of gellan: Current state and perspectives. Applied Microbiology and Biotechnology 79:889-900.

Good, N.A. 2018. An Acute Oral Gavage Toxicity Study with MON 87429 FT_T Protein in CD-1 Mice. Monsanto Technical Report MSL0029801. St. Louis, Missouri.

Gu, X. 2018. Assessment of the in vitro Digestibility of *Escherichia coli*-produced Dicamba Monooxygenase Protein by Pepsin and Pancreatin. Monsanto Technical Report MSL0029822. St. Louis, Missouri.

Gu, X., R.E. Hileman, and A. Silvanovich. 2018. Bioinformatics Evaluation of the DMO and FT_T Proteins in MON 87429 Utilizing the AD_2018, TOX_2018, and PRT_2018 Databases. Monsanto Technical Report MSL0029452. St. Louis, Missouri.

Heller, D., E.J. Helmerhorst, A.C. Gower, W.L. Siqueira, B.J. Paster and F.G. Oppenheim. 2016. Microbial diversity in the early *in vivo*-formed dental biofilm. Applied and Environmental Microbiology 82:1881-1888.

Hérouet, C., D.J. Esdaile, B.A. Mallyon, E. Debruyne, A. Schulz, T. Currier, K. Hendrickx, R.-J. van der Klis and D. Rouan. 2005. Safety evaluation of the phosphinothricin acetyltransferase proteins encoded by the *pat* and *bar* sequences that confer tolerance to glufosinate-ammonium herbicide in transgenic plants. Regulatory Toxicology and Pharmacology 41:134-149.

ILSI-CERA. 2010. A review of the environmental safety of the CP4 EPSPS protein. International Life Sciences Institute, Center for Environmental Risk Assessment, Washington, D.C.

Jin, D., X. Kong, B. Cui, Z. Bai and H. Zhang. 2013. Biodegradation of di-n-butyl phthalate by a newly isolated *Halotolerant Sphingobium* sp. International Journal of Molecular Sciences 14:24046-24054.

Kämpfer, P. 2006. The family *Streptomycetaceae*, Part I: Taxonomy. Pages 538-604 in The Prokaryotes. A Handbook on the Biology of Bacteria: Archaea. Bacteria: Firmicutes, Actinomycetes. Volume 3. M.Dworkin, S. Falkow, E. Rosenberg, K.-H. Schleifer, and E. Stackebrandt (eds.). Springer+ Business Media, LLC., New York, New York.

Klusmeyer, T.H., Helm, J.M., Riordan. S.G. 2018. Compositional Analyses of Maize Grain and Forage Harvested from MON 87429 Grown in the United States During the 2017 Season. Monsanto Technical Report MSL0029410. St. Louis, Missouri.

Kutzner, H.J. 1981. The family streptomycetaceae. Pages 2028-2090 in The Prokaryotes: A Handbook on Habitats, Isolation, and Identification of Bacteria. Volume 2. M.P. Starr, H. Stolp, H.G. Trüper, A. Balows, and H.G. Schlegel (eds.). Springer-Verlag, Berlin, Germany.

Leach, J.N., R. E. Hileman, J. J. Throp, C. George and J. D. Astwood, 2002. Assessment of the *in vitro* Digestibility of Purified *E. coli*-produced CP4 EPSPS Protein in Simulated Gastric Fluid. Monsanto Technical Report MSL 17566. St. Louis, Missouri.

Lira, F., G. Berg and J.L. Martínez. 2017. Double-face meets the bacterial world: The opportunistic pathogen *Stenotrophomonas maltophilia*. Frontiers in Microbiology 8:2190.

Loy, D.D. and E.L. Lundy. 2019. Nutritional properties and feeding value of corn and its coproducts. Pages 633-659 in Corn: Chemistry and Technology. Third Edition. S.O. Serna-Saldivar (ed.). Woodhead Publishing and AACC International Press.

May, J.B. 1987. Wet milling: Process and products. Pages 377-397 in Corn: Chemistry and Technology. S.A. Watson and P.E. Ramstad (eds.). American Association of Cereal Chemists, St. Paul, Minnesota.

Mukherjee, P. and P. Roy. 2016. Genomic potential of *Stenotrophomonas maltophilia* in bioremediation with an assessment of its multifaceted role in our environment. Frontiers in Microbiology 7:967.

Naylor, M.W. 1993. Acute Oral Toxicity Study of CP4 EPSPS Protein in Albino Mice. Monsanto Technical Report MSL13077. St. Louis, Missouri.

OECD. 2000. Report of the task force for the safety of novel foods and feeds. C(2000)86/ADD1. Organisation of Economic Co-operation and Development, Paris, France.

OECD. 2002. Consensus document on compositional considerations for new varieties of maize (*Zea mays*): Key food and feed nutrients, anti-nutrients and secondary plant metabolites. ENV/JM/MONO(2002)25. Series on the Safety of Novel Foods and Feeds, No. 6. Organisation for Economic Co-operation and Development, Paris, France.

Okuno, N.T., I.R. Freire, R.T.R.S. Segundo, C.R. Silva and V.A. Marin. 2018. Polymerase chain reaction assay for detection of *Stenotrophomonas maltophilia* in cheese samples based on the *smeT* gene. Current Microbiology 75:1555-1559.

Pozo, C., B. Rodelas, M.V. Martínez-Toledo, R. Vílchez and J. González-López. 2007. Removal of organic load from olive washing water by an aerated submerged biofilter and profiling of the bacterial community involved in the process. Journal of Microbiology and Biotechnology 17:784-791.

Rijavec, T., A. Lapanje, M. Dermastia and M. Rupnik. 2007. Isolation of bacterial endophytes from germinated maize kernels. Canadian Journal of Microbiology 53:802-808.

Roberts, A., Y. Devos, A. Raybould, P. Bigelow and A. Gray. 2014. Environmental risk assessment of GE plants under low-exposure conditions. Transgenic Research 23:971-983.

Skottke, K. and A. Silvanovich. 2018. Updated Bioinformatics Evaluation of the CP4 EPSPS Protein Utilizing the AD_2018, TOX_2018, and PRT_2018 Databases. Monsanto Technical Report RAR-2018-0126. St. Louis, Missouri.

Smedley, J.W. 2012a. An Acute Toxicity Study of *E. coli*-produced MON 88701 DMO Administered by the Oral Gavage Route to Mice. Monsanto Technical Report CRO-2011-035. St. Louis, Missouri.

Smedley, J.W. 2012b. An Acute Toxicity Study of *E. coli*-produced Phosphinothricin N-acetyltransferase (PAT [bar]) Protein Administered by the Oral Gavage Route to Mice. Monsanto Technical Report CRO-2011-007. St. Louis, Missouri.

Takeuchi, M., K. Hamana and A. Hiraishi. 2001. Proposal of the genus *Sphingomonas sensu stricto* and three new genera, *Sphingobium*, *Novosphingobium* and *Sphingopyxis*, on the basis of phylogenetic and chemotaxonomic analyses. International Journal of Systematic and Evolutionary Microbiology 51:1405-1417.

Thomas, P., S. Kumari, G.K. Swarna and T.K.S. Gowda. 2007. Papaya shoot tip associated endophytic bacteria isolated from in vitro cultures and host-endophyte interaction in vitro and in vivo. Canadian Journal of Microbiology 53:380-390.

Todaro, M., N. Francesca, S. Reale, G. Moschetti, F. Vitale and L. Settanni. 2011. Effect of different salting technologies on the chemical and microbiological characteristics of PDO Pecorino Siciliano cheese. European Food Research and Technology 233:931-940.

Varman, A.M., L. He, R. Follenfant, W. Wu, S. Wemmer, S.A. Wrobel, Y.J. Tang and S. Singh. 2016. Decoding how a soil bacterium extracts building blocks and metabolic energy from ligninolysis provides road map for lignin valorization. Proceedings of the National Academy of Sciences of the United States of America 113:E5802-E5811.

Watson, S.A. 1988. Corn marketing, processing, and utilization. Pages 881-940 in Corn and Corn Improvement. Third Edition. G.F. Sprague and J.W. Dudley (eds.). American Society of Agronomy, Inc., Crop Science Society of America, Inc., Soil Science Society of America, Inc., Madison, Wisconsin.

Vest, J. and A. Silvanovich. 2018. Bioinformatics Evaluation of the PAT Protein Utilizing the AD_2018, TOX_2018, and PRT_2018 Databases. Monsanto Technical Report RAR-2018-0231. St. Louis, Missouri.

Zipper, C., K. Nickel, W. Angst and H.-P.E. Kohler. 1996. Complete microbial degradation of both enantiomers of the chiral herbicide mecoprop [(RS)-2-(4-chloro-2-methylphenoxy)propionic acid] in an enantioselective manner by *Sphingomonas herbicidovorans* sp. nov. Applied and Environmental Microbiology 62:4318-4322.