EPPO CODES

An overview

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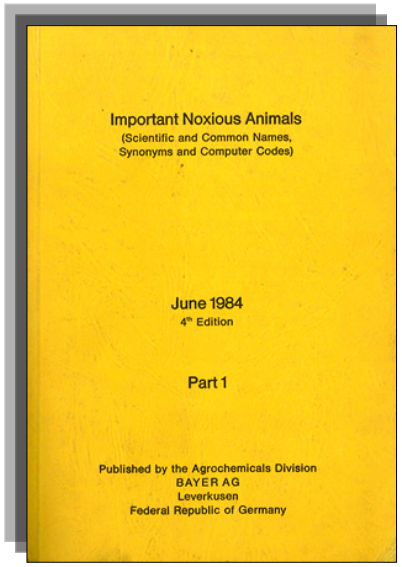
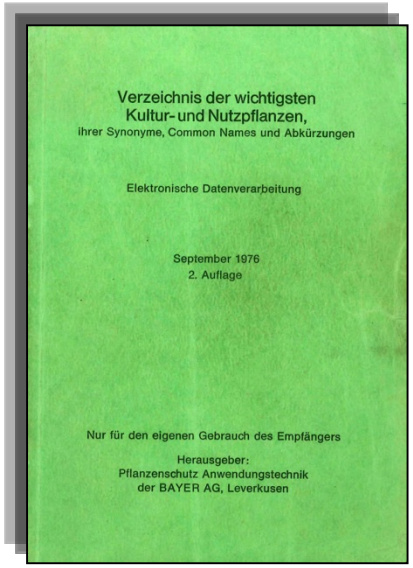
Brief history

Computer coding system: a BAYER initiative

In the 1970s, BAYER started to develop **computer codes** for plants, pests and pathogens important in agriculture and compiled their scientific and common names:

➡ **BAYER CODES**



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02549  BEMIGO EHA     BEMISIA GOLDINGI

02550  BEMIIN EHA     BEMISIA INCONSPICUA
                   E  SWEETPOTATO WHITEFLY
                   E  WHITEFLY, SWEETPOTATO

02551  BEMILO EHA     BEMISIA LONGISPINA

02552  BEMIMA EHA     BEMISIA MANIHOTIS

02553  BEMIMY EHA     BEMISIA MYRICAE
                   E  MYRICA WHITEFLY
                   E  WHITEFLY, MYRICA

02554  BEMINI EHA     BEMISIA NIGERIENSIS

02555  BEMIRH EHA     BEMISIA RHODESIAENSIS

02556  BEMISH EHA     BEMISIA SHINANOENSIS
                   E  MULBERRY WHITEFLY
                   E  WHITEFLY, MULBERRY

02557  BEMISP EHA     BEMISIA SP.
                   S  MOSCA BLANCA

02558  BEMITA EHA     BEMISIA TABACI
                      BEMISIA GOSSYPERDA *S
                   D  BATATENMOTTENSCHILDLAUS
                   D  BAUMWOLLMOTTENSCHILDLAUS
                   D  TABAKMOTTENSCHILDLAUS
                   D  WEISSE FLIEGE
                   E  COTTON WHITEFLY
                   E  SWEETPOTATO WHITEFLY
                   E  TOBACCO WHITEFLY
                   E  WHITEFLY, COTTON
                   E  WHITEFLY, SWEETPOTATO
                   E  WHITEFLY, TOBACCO
                   H  KNIMAT ASH HATABAK
                   P  MOSCA BRANCA DO FEIJAO (BRASIL)
                   S  MOSQUITA BLANCA DEL TABACO (MEXICO)
                   T  BEYAZ SINEK

02559  BEMITU EHA     BEMISIA TUBERCULATA

02560  BEMIVA EHA     BEMISIA VAYSSIERI

02561  BEMXSP ENB     BEMBIX SP.
                   D  GRABWESPENARTEN
                   D  KREISELWESPEN
                   D  WESPEN, KREISEL-

02562  BERYMI EGX     BERYTINUS MINOR

02563  BERYSP EGX     BERYTINUS SP.
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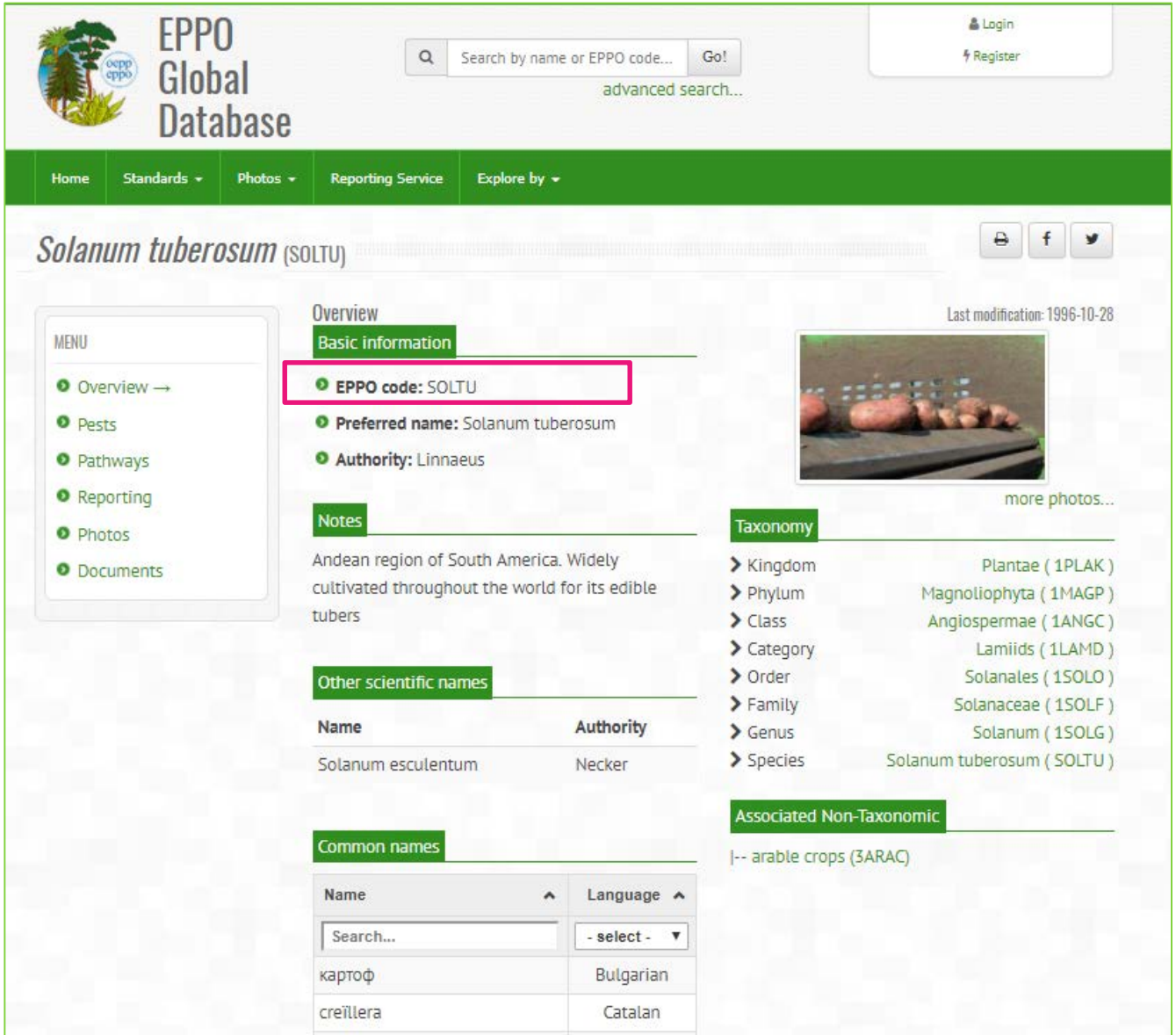
Brief history

- 1996: BAYER transferred to EPPO the maintenance and development of the BAYER coding system
- 1990s-2000s: EPPO included codes into a ‘Plant Protection thesaurus’ (EPPT: an interface facilitating access to codes and names), developed a hierarchical system to reflect taxonomic links, and created codes for viruses
- 2007: it was agreed to rename BAYER codes ‘EPPO codes’
- 2007: EPPT was made freely accessible on the Internet
- 2014: the whole content of EPPT is transferred into a new database (EPPO Global Database)

EPPO Global Database

Repository for all EPPO codes: https://gd.eppo.int



EPPO codes: a few general principles

For cultivated and wild plant species (including weeds)

5 letters = 3 (genus) + 2 (species)

S O L T U

Solanum tuberosum: SOLTU

An unspecified species of *Solanum*: SOL**SS**

Genus *Solanum*: **1**SOL**G**

Mnemonic element: whenever possible, codes are constructed on the basis of the current scientific name

EPPO codes: a few general principles

For pests and pathogens:

6 letters = 4 (genus) + 2 (species)

B E M I T A

The species *Bemisia tabaci*: BEMITA

An unspecified species of the genus *Bemisia*: BEMI**SP**

Genus *Bemisia*: **1**BEMI**G**

Special case of viruses:
codes are constructed with the acronyms
***Tomato yellow leaf curl virus* (TYLCV) = TYLCV0**

EPPO codes: a few general principles

1 biological entity = 1 unique code

Change of preferred scientific name:

Gnorimoschema absoluta = *Tuta absoluta*

➡ The code **GNORAB** remains the same

Newly described species:

Phytophthora pinifolia

➡ A new code **PHYTPF** is created

EPPO codes: a few general principles

A code once given may not be deleted or used again for other purposes

In some instances, often resulting from successive taxonomic changes (e.g. synonymization), codes have to be deactivated (NOT deleted) to avoid duplication of codes

1 biological entity = 1 unique code

A few numbers …

March 2018

- 42 600 plant species (cultivated, wild, weeds)
- 25 100 animal species (e.g. insects, mites, nematodes, rodents), biocontrol agents
- 9 500 microorganisms species (e.g. bacteria, fungus, viruses and virus-like)
- 450 non-taxonomic codes (e.g. crop groups)

In total more than 77 200 species important for agriculture and plant protection

On average more than 2 000 new codes are created per year

What is the content of the coding system?

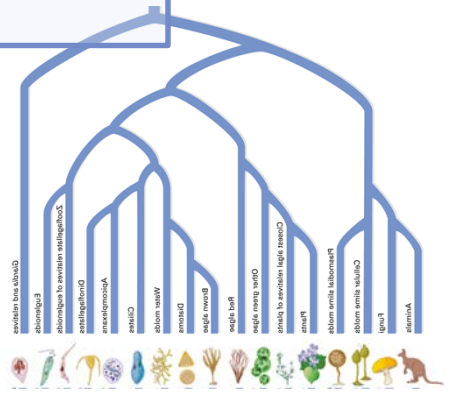
For each organism it contains:

- EPPO code
- Preferred scientific name
- Synonyms and other scientific names
  (e.g. fungal anamorph/teleomorph, virus acronyms)
- Common names in different languages
- Elements of taxonomy

EPPO codes (taxonomic)

Taxonomic tree: harmonized coding - parent/child relationships

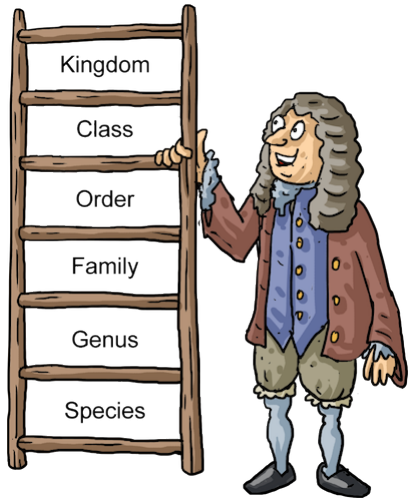
Kingdom	Animalia	1ANIMK
Phylum	Arthropoda	1ARTHP
Subphylum	Hexapoda	1HEXAQ
Class	Insecta	1INSEC
Order	Hemiptera	1HEMIO
Suborder	Sternorrhyncha	1STERR
Family	Aleyrodidae	1ALEYF
Genus	Bemisia	1BEMIG
Species	Bemisia tabaci	BEMITA



A few general remarks about taxonomy

The database has **not** been designed as a taxonomic tool

- It does not display all taxonomic levels (only the main ones)
- It does not provide an exhaustive list of all synonyms (tries to focus on names which have been used for some time in the literature to facilitate data retrieval)



Scientific names

Examples of sources used by the EPPO Secretariat

Pests

- Global Biodiversity Information Facility : http://www.europe.gbif.net/
- International Code of Zoological Nomenclature: http://www.iczn.org/iczn/index.jsp
- Pest specific databases (e.g. Psyll'list, WoRMS, ScaleNet, Tortricid.net)

Fungi

- Index Fungorum: http://www.speciesfungorum.org/Names/Names.asp
- Mycobank: http://www.mycobank.org/DefaultPage.aspx

Bacteria and phytoplasmas

- List of prokaryotic names with standing in nomenclature: http://www.bacterio.cict.fr

Viruses

- International Committee on Taxonomy of Viruses (ICTV): https://talk.ictvonline.org/

Plants

- The Plant List: http://www.theplantlist.org/
- International Organization for Plant Information: http://www.bgbm.fu-berlin.de/IOPI/GPC/query.asp
- International Code of Botanical Nomenclature: http://www.bgbm.fu-berlin.de/iapt/nomenclature/code/

and Google !

Common names in different languages

lang	Count
Scientific	143231
English	45615
German	28261
French	31975
Spanish	25990
Italian	13903
Dutch	7241
Portuguese	10888
Swedish	6366
Japanese	9004
Russian	14872
Danish	3589
Norwegian	2736
Finnish	2781
Turkish	4042
Hebrew	2350
Afrikaans	200
Persian	58
Polish	4748
Malay	16
Hungarian	3501

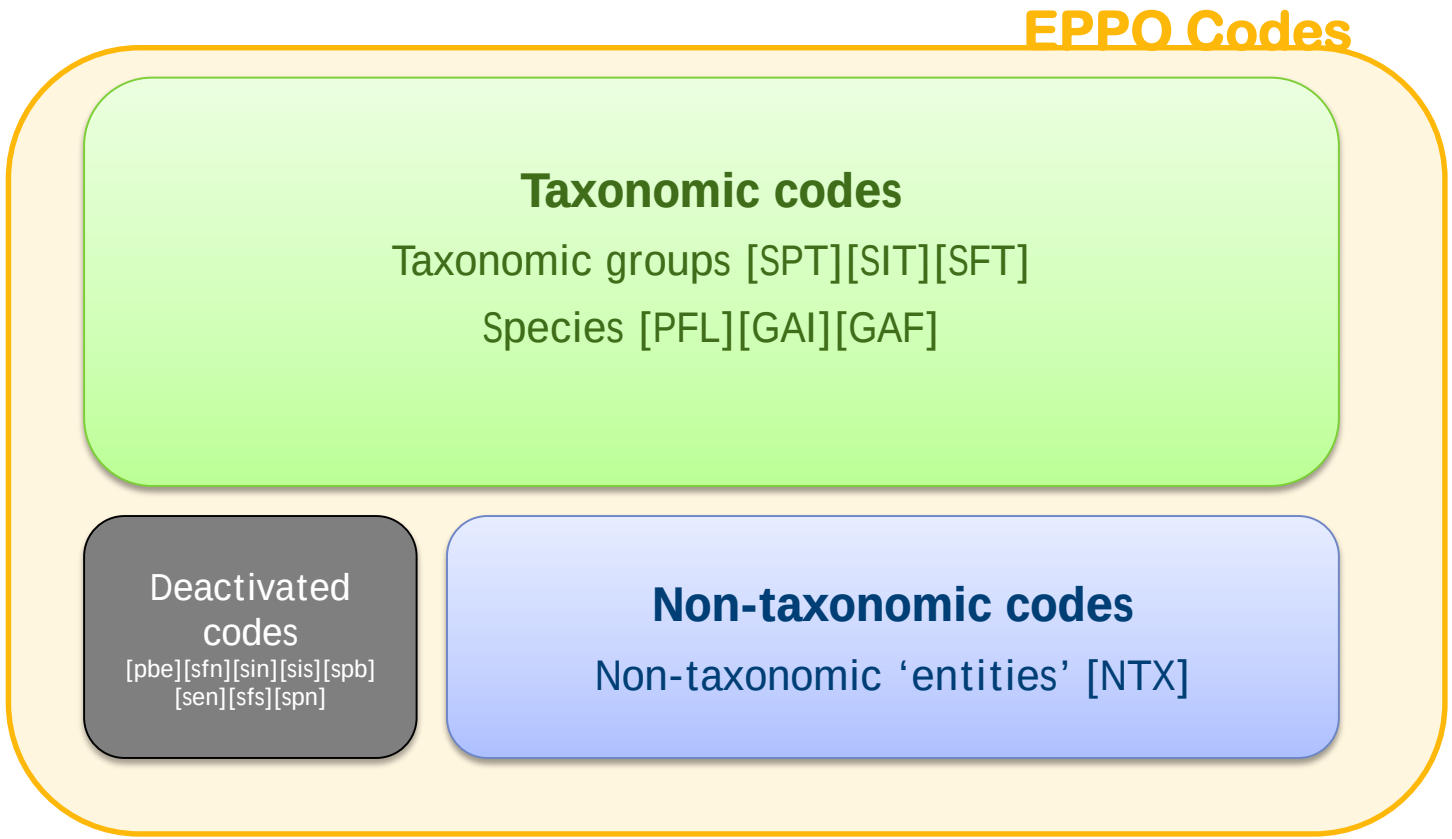
and more ...

Botryotinia fuckeliana (Botrytis cinerea)

[de] Graufäule
[de] Grauschimmel
[en] Brownish-grey mildew
[en] Grey mould
[es] Mancha gris de las hojas
[es] Moho gris: fresa
[es] Podredumbre gris
[fr] Cinérite
[fr] Grillure des feuilles
[fr] Maladie de la toile
[fr] Moisissure commune
[fr] Moisissure grise
[fr] Pourriture grise

Codes for non-taxonomic entities

Creation of a new data-type field to separate taxonomic from non-taxonomic codes



Example of taxonomic/non-taxonomic codes

***Solanum lycopersicum* (tomato)**	**LYPES**
tomato (direct-seeded)	**LYPXS**
tomato (transplanted)	**LYPXP**

LYPES
Preferred name: *Solanum lycopersicum*
Synonym: *Lycopersicum esculentum*
Taxonomic code [PFL]

LYPXS
Preferred name: tomato (direct-seeded)

LYPXP
Preferred name: tomato (transplanted)
Non-taxonomic codes [NTX]

Creation of new EPPO Codes

Taxonomic codes

EPPO Secretariat manages all requests

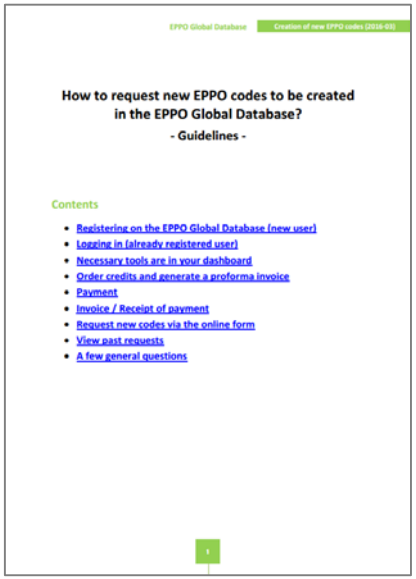
Online forms/fees

Non-taxonomic codes

EPPO Panel on harmonization of data on PPPs is involved

Approval procedure

Creation of new EPPO Codes


EPPO Global Database | Creation of new EPPO codes (2016-03)

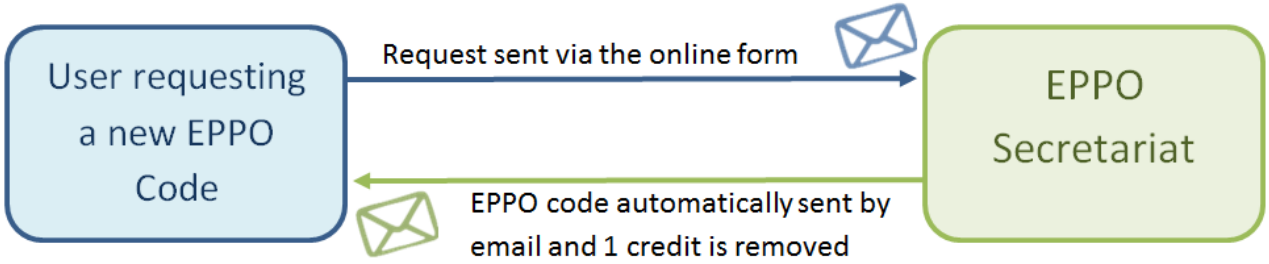
How to request new EPPO codes to be created in the EPPO Global Database?

- Guidelines -

Contents

- Registering on the EPPO Global Database (new user)
- Logging in (already registered user)
- Necessary tools are in your dashboard
- Order credits and generate a proforma invoice
- Payment
- Invoice / Receipt of payment
- Request new codes via the online form
- View past requests
- A few general questions

- ✓ Additional service subject to fees (50 euros per code)
- ✓ All necessary online forms have been created in **EPPO Global Database**
- ✓ Guidance has been added to the website



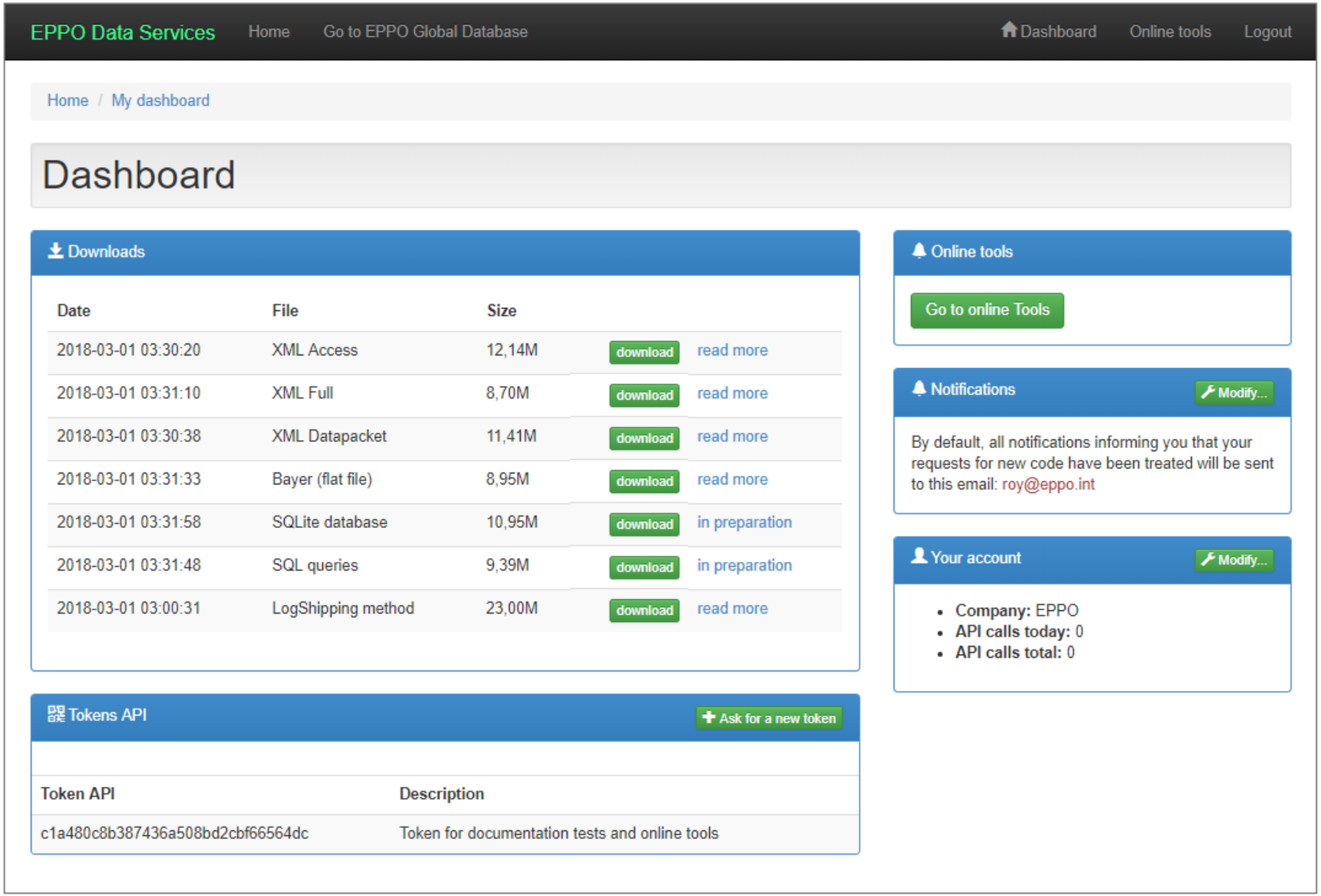
EPPO codes can be used in other IT systems

- The whole set of EPPO codes and associated names is freely available under the terms of an open data licence.
- Web services are being developed to facilitate downloading of EPPO codes (so that they can be used in other IT systems).

Downloads - EPPO Data Services
The open data licence, computer files (in different formats) and explanations are available from a dedicated platform: the EPPO Data Services
https://data.eppo.int

EPPO Data Services: https://data.eppo.int/

(create your free account first)



Who is using the EPPO codes?

- Phytopharmaceutical industry (e.g. Bayer, Dupont, Dow, Syngenta)
- National Plant Protection Organizations (NPPOs)
- Research Institutes (CIRAD)
- International Organizations (IPPC, CABI, EU Commission)
- EPPO (in all its databases)

Achievements in 2017

- With the help of Ms Grousset: +2500 codes for ornamental plant species have been created (for ePhyto – the FAO/IPPC electronic phytosanitary certification system)

- All newly accepted codes for the harmonized classification of plant protection products uses have been transferred into GD (mainly crop groups)

- A grant agreement has been signed with the EU Commission for the development of the EPPO code system

Achievements in 2017

- Webservices have been further developped to help users to query the database rapidly

- New IT tools have been created for the EPPO database administrators (e.g. to add batches of verified common names in various languages)

Plans for 2018

- With the help of Ms Grousset: continue to populate the database with more codes

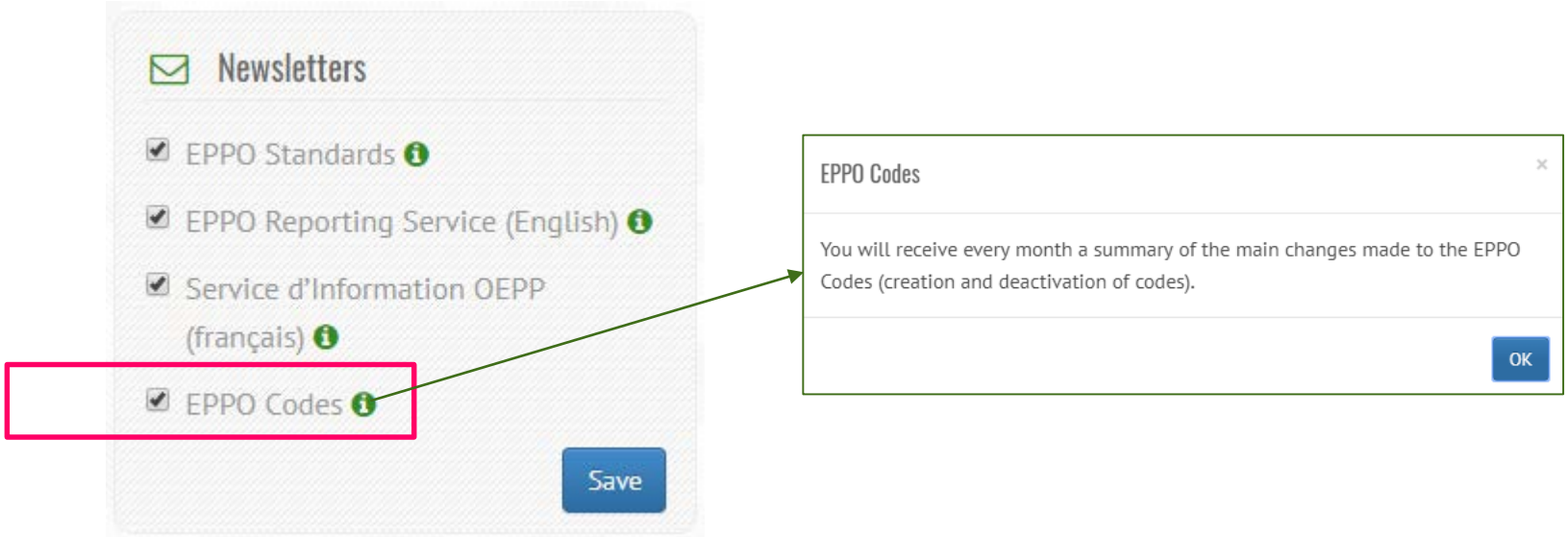
- Continue to develop the harmonized classification of PPPs uses with the EPPO Panel

- Release the EPPO Codes monthly newsletter summarizing the main changes made to the EPPO Codes: new codes / deactivated codes

EPPO Codes monthly newsletter

How to register?

1) Create your free account in the EPPO Global Database
2) Login
3) In your dashboard, choose the EPPO Codes Newsletter



EPPO Codes monthly newsletter

- **Free newsletter addressed to EPPO Codes users – sent by email**

- **Summary of the main modifications made during a monthly period**
  - list of newly created codes
  - list of deactivated codes with their replacement codes (if appropriate)

- **Lists are automatically generated from the database**

- For clarity, other modifications (changes in preferred scientific names, authors, synonyms, common names) are not shown but these modifications can be traced in the core database files (e.g. for users who are downloading EPPO Codes files via the EPPO Data Services)

EPPO Codes monthly newsletter

EPPO Codes Monthly Newsletter: 2018-02

This free newsletter is addressed to all EPPO Codes users. Its objective is to summarize the main modifications that have been made to the database during a monthly period (the month covered is indicated in the tittle) and provide users with an easy and transparent way of tracing major changes. The Newsletter contains a list of newly created codes and a list of deactivated codes with their replacement codes. These lists are automatically generated from the database. Other modifications concerning data that is related to already existing codes, such as changes in preferred scientific names, authors of scientific names, synonyms, common names are not shown to keep the Newsletter easy to read. However, these modifications can be traced in the core database files (e.g. for users who are downloading EPPO Codes files via the EPPO Data Services).
More general information about the EPPO Codes can be found on the EPPO website.

Summary

New codes	141
Deactivated	9

New codes

Microorganism

Code	Pref name
CYTOPA	Cytospora parasitica
DIPDSC	Diplodia scrobiculata
PHYPAE	Phytoplasma americanum
XANTFF	Xanthomonas fuscans subsp. fuscans

Animal

Code	Pref name
ATHKSP	Atheloca sp.
ATHKSU	Atheloca subrufella
MELGIZ	Meloidogyne izalcoensis
NOORBL	Noorda blitealis

and more ….

EPPO Codes monthly newsletter

Deactivated codes

Microorganism

Code	Pref name	Comment
PHYPAM	Phytoplasma americanum	Deactivated because PHYPAM had been used in the past for Physopella ampelopsidis (against the rules) Replaced by PHYPAE

Plant

Code	Pref name	Comment
CZSRU	Cytisus ratisbonensis	Replaced by CCJRA
ERADF	Eragrostis diffusa	Synonym of Eragrostis pectinacea Replaced by ERAPE
IBECR	Iberis crenata	Synonym of Iberis amara Replaced by IBEAM
IBEPT	Iberis pruitii	Synonym of Iberis carnosa Replaced by IBETE
RESIL	Reseda jacquinii subsp. litigiosa	
SILNS	Silene nutans subsp. smithiana	Replaced by SILNU
THLRI	Thlaspi rivale	Synonym of Noccaea brevistyla Replaced by THLBS

Conclusions

EPPO codes are a harmonized set of codes for plant and pest names which can be used to:

- Avoid typing errors during data entry and ensure consistency of data over time
- Provide an efficient way of dealing with taxonomic changes and different languages in databases
- Ensure consistent searches within databases
- Facilitate data exchange between databases

Thank you for your attention