Absolute EC 50 calculation

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July 24, 2018

```
# install and load packages
if (!require ("pacman")) install.packages("pacman")
```

```
## Loading required package: pacman
```

```
library(pacman)
p_load(tidyverse, drc, readxl, openxlsx)

# read data into r
a <- read_excel("data.xlsx")
a
```

```
## # A tibble: 1,896 x 7
##    Exp_rep Fungicide   dose ID    response control  relY
##      <dbl> <chr>      <dbl> <chr>    <dbl>   <dbl> <dbl>
##  1       1 boscalid   0.025 1010      4.23    5.71 74.1
##  2       1 boscalid   0.5   1010      1.9     5.71 33.3
##  3       1 boscalid   1     1010      1.84    5.71 32.3
##  4       1 boscalid  15     1010      1.33    5.71 23.3
##  5       1 boscalid   0.025 1013      4.41    6.02 73.2
##  6       1 boscalid   0.5   1013      1.66    6.02 27.5
##  7       1 boscalid   1     1013      1.51    6.02 25.1
##  8       1 boscalid  15     1013      0.15    6.02  2.49
##  9       1 boscalid   0.025 1015      4.04    5.65 71.5
## 10       1 boscalid   0.5   1015      1.81    5.65 32.0
## # ... with 1,886 more rows
```

```
# write a function to get absolute EC50
f.get_ec50 <- function(df){
  # fit a 3-parameter log-logistic model to the relative growth data, lower asymptote is kept fixed at
  ec50.ll3 <- drm(df$relY ~ df$dose,
                  fct = LL.3(fixed = c(NA, NA, NA), names = c("Slope", "Upper", "EC50")),
                  na.action = na.omit)

  # put absolute EC50, its standard error, and confidence intervals into a data frame
  ec50.abs <- data.frame(ED(ec50.ll3, respLev = c(50), type = "absolute", interval = "delta"),
                         stringsAsFactors = FALSE)
  return(ec50.abs)
}
```

```
# use dplyr package to get ec50s in a data.frame by different factors
result <- a %>%
  group_by(Fungicide, ID, Exp_rep) %>%
  do(f.get_ec50(.))

# take an average of ec50 from Exp_rep 1 and 2
```

```r
result1 <- result %>%
  group_by(Fungicide, ID) %>%
  summarise(EC50_abs = mean(Estimate, na.rm = TRUE))
```

```r
result1
```

```
## # A tibble: 237 x 3
## # Groups:   Fungicide [?]
##    Fungicide ID    EC50_abs
##    <chr>     <chr>    <dbl>
##  1 boscalid  1010    0.224
##  2 boscalid  1013    0.159
##  3 boscalid  1015    0.248
##  4 boscalid  1016    0.144
##  5 boscalid  1021    0.223
##  6 boscalid  143     0.102
##  7 boscalid  152     0.170
##  8 boscalid  202     0.0979
##  9 boscalid  274     0.132
## 10 boscalid  293E    0.119
## # ... with 227 more rows
```

```r
# write to results to an excel file
write.xlsx(result1, "ec50_abs.xlsx")
```