

Package ‘APTicalc’

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Type Package

Title Air Pollution Tolerance Index (APTI) Calculator

Version 0.1.1

Depends R (>= 3.5.0)

Suggests roxygen2, knitr, rmarkdown, testthat (>= 3.0.0)

VignetteBuilder knitr

Description It calculates the Air Pollution Tolerance Index (APTI) of plant species using biochemical parameters such as chlorophyll content, leaf extract pH, relative water content, and ascorbic acid content. It helps in identifying tolerant species for greenbelt development and pollution mitigation studies. It includes a 'shiny' app for interactive APTI calculation and visualisation. For method details see, Sahu et al. (2020).<[DOI:10.1007/s42452-020-3120-6](https://doi.org/10.1007/s42452-020-3120-6)>.

License GPL (>= 2.0)

Encoding UTF-8

Imports shiny, ggplot2

RoxygenNote 7.3.2

LazyData true

NeedsCompilation no

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comp_apti

Air Pollution Tolerance Index Calculator

Description

This function calculates the Air Pollution Tolerance Index (APTI) using plant biochemical parameters: ascorbic acid (A), total chlorophyll (T), leaf extract pH (P), and relative water content (R) and classifies plants into tolerance categories based on biochemical parameters. APTI helps assess plant tolerance to air pollution.

Usage

```
comp_apti(A, TC, P, R)
```

Arguments

A	Numeric vector of Ascorbic acid content, unit is mg per g dry weight
TC	Numeric vector of Total chlorophyll content, unit is mg per g dry weight
P	Numeric vector of Leaf extract pH.
R	Numeric vector of Relative water content, in percentage

Details

This function returns original parameters, computed APTI values, and tolerance categories: "Sensitive", "Intermediate", or "Tolerant".

Value

A data frame containing APTI values and tolerance category:

APTI Calculated index value.

Category Plant tolerance class: **Sensitive** (<12), **Intermediate** (12–20), or **Tolerant** (>20).

References

1. Singh, S.K. and Rao, D.N. (1983) Evaluation of Plants for Their Tolerance to Air Pollution. Symposium on Air Pollution Control, 1983, 218-224.
2. Thakar, B. K., & Mishra, P. C. (2010). Dust collection potential and air pollution tolerance index of tree vegetation around Vedanta Aluminium Limited, Jharsuguda. The Bioscan, 3, 603-612.
3. Sahu, C., Basti, S., & Sahu, S. K. (2020). Air pollution tolerance index (APTI) and expected performance index (EPI) of trees in Sambalpur town of India. SN Applied Sciences, 2(8), 1327.

Examples

```
A <- c(4.91, 5.00, 4.90)
TC <- c(9.987, 8.881, 8.202)
P <- c(3.927, 3.872, 4.168)
R <- c(46.71, 55.11, 52.01)
comp_apti(A, TC, P, R)
```

`run_apti_app`*Run APTI 'Shiny' App*

Description

Launches a 'Shiny' app for interactive APTI calculation and visualization.

Usage

```
run_apti_app()
```

Value

Launches a Shiny application.

Examples

```
if (interactive()) {
  run_apti_app()
}
```

`sample_data`*Sample data for APTI calculation*

Description

A dataset containing biochemical parameters used to compute APTI.

Usage

```
sample_data
```

Format

A data frame with 15 rows and 4 variables:

A Ascorbic acid content (mg/g)

TC Total chlorophyll content (mg/g)

P Leaf extract pH

R Relative water content (%)

Source

Manually entered for demonstration

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