

Plant library takes on the global weeds menace

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At-risk native plants worldwide have gained a new ally in their losing battle against aggressive and insidious feral weeds.

International scientists have developed a database with in-depth information on over 600 plant species, including the black pine, prickly cactus, thyme, milkweed, wild garlic and baby root orchid. Called the "[COMPADRE Plant Matrix Database](#)", it is currently the world's largest open-access source of endangered, native and feral plant demographics.

With the data free and available in a single website, scientists and park managers can use it to better protect [native plants](#) and national parks against threats from weeds and climate change, says lead researcher Roberto Salguero-Gómez of The ARC Centre of Excellence for Environmental Decisions (CEED), The University of Queensland, and the Max Planck Institute for Demographic Research (Germany).

"Invasive weeds are a major threat to native plants and animals worldwide, and are an extremely costly problem," says Dr Salguero-Gómez. "These weeds compete with native plants for space, nutrients and sunlight, wreck our soil and poison our livestock."

Currently, Australia spends \$4 billion every year in weed control in agriculture alone. The common invaders include fireweed, alligator weed, gamba grass, asparagus fern, rubber vine, cat's claw vine and silver nightshade.

"Despite our efforts to exterminate these invaders, some of them can – and have – spread beyond our control," says Dr Salguero-Gómez. "We also have new species entering Australia continuously – since 2000, 36 new weeds have sneaked into our lands, and these are only the ones that we're aware of."

To provide native plants a better chance of overcoming extinction, among other ecological and evolutionary questions, the team compiled the lifecycles and demographics on over 600 endangered, native and invasive species in the COMPADRE database.

"In the first open-access release of COMPADRE, we are making available the data from 468 scientific studies containing over 600 species that have been carefully checked," says Dr Salguero-Gómez. "These species are only the starting point as we plan to expand the database in the coming years and decades."

COMPADRE contains information on every stage of a plant's lifecycle – seed, seedling, juvenile, adults, where it lives, and fundamental demographic information that allows users to find out how it thrives in an environment, its rate of extinction, its chances of becoming invasive, and when and where it is most vulnerable.

These rich data can be used, among other examples, to determine the most cost-effective way to save an endangered plant or eradicate a weed.

One example is the rhododendron shrub, which is currently endangered in Spain, but is the most aggressive weed in the UK, Dr Salguero-Gómez explains. "With COMPADRE, we can find out where the weeds grow as well as the biogeographic information of the area."

"Once we know what is causing the shrub populations to decline in Spain, and what conditions are allowing it to thrive in the UK, we may

use the information to save the endangered plants in one country and kill the weeds in another."

Dr Salguero-Gómez says the database can also help governments cut their costs on weed eradication: "COMPADRE allows us to predict how a newly introduced species will behave, and when is the best time to strike. If we can stop the weed from spreading in the first place, we can save huge amounts of money, time and effort, and use these precious resources on other areas in conservation."

"The database will be updated continuously. We currently have records for over 1000 species that are being carefully digitised and error-checked. Having in-depth information in a single, open-access repository will allow us to address questions in conservation, ecology and evolution that haven't been answered simply because the necessary data were not previously available."

More information: Salguero-Gómez, R., Jones, O. R., Archer, C. R., Buckley, Y. M., Che-Castaldo, J., Caswell, H., Hodgson, D., Scheuerlein, A., Conde, D. A., Brinks, E., de Buhr, H., Farack, C., Gottschalk, F., Hartmann, A., Henning, A., Hoppe, G., Römer, G., Runge, J., Ruoff, T., Wille, J., Zeh, S., Davison, R., Vieregg, D., Baudisch, A., Altwegg, R., Colchero, F., Dong, M., de Kroon, H., Lebreton, J.-D., Metcalf, C. J. E., Neel, M. M., Parker, I. M., Takada, T., Valverde, T., Vélez-Espino, L. A., Wardle, G. M., Franco, M., Vaupel, J. W. (2014), "The compadre Plant Matrix Database: an open online repository for plant demography." *Journal of Ecology*. [DOI: 10.1111/1365-2745.12334](https://doi.org/10.1111/1365-2745.12334)

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