

Alcantarea *imperialis*

In recent years this huge bromeliad has become immensely popular as a landscape feature and the tall flowering candelabras are highlights of Macquarie University's central courtyard. In its natural environment, it is a native of Brazil where it grows on rock (hence, a *lithophyte*) in the Serra dos Órgãos, a dramatic rocky escarpment in the state of Rio de Janeiro. In this seasonally dry tropical biome, *Alcantarea* can survive in high light, high temperatures and



Distribution of *Alcantarea imperialis* in Brazil, South America, modified from *Kew, Plants of the World Online*

extremely dry conditions. It is truly one of largest bromeliads: leaves can be up to 1.5 metres long and 15 centimetres wide and the flowering stems (*inflorescences*) can be three metres tall. *Alcantarea* is known as a *tank* bromeliad. The *tank* is comprised of overlapping leaf bases, tightly pressed together to produce a central water storage unit; those of *Alcantarea* can hold up to 30 litres of water. The water in bromeliad *tanks* is augmented by decaying plants and invertebrates that provide a nutrient source for bacteria, mosquito larvae, crustaceans and protozoa that are then eaten by larger animals including frogs, rodents, crabs, snails, lizards, snakes and birds. The *tank* can be an invaluable resource in an otherwise dry environment.



A *tank* formed by a rosette of tightly overlapping leaves in *Aechmea*.

The majority of bromeliad species are epiphytes (grow on trees) or lithophytes (grow on rock) so it is not surprising that roots are often not well developed, or absent, and those that are present merely function to anchor the bromeliad to a host tree or rock.





One open flower in an *Alcantarea* inflorescences

Many bromeliads produce conspicuous flowers, and there are mutualistic relationships between plant species and pollinators, with traits developed specifically for pollination by specific pollinators. In the Americas where almost all bromeliads are found, pollinators include hummingbirds, bats, butterflies and moths while at Macquarie University, Rainbow Lorikeets enjoy its nectar.



Alcantarea unopened flower buds



Botanists describe the family Bromeliaceae as being one of the *most morphologically distinct, ecologically diverse and species-rich* groups of flowering plants native to tropical and subtropical regions of the New World (the Americas). There are over 3,000 species in about 56 genera, with one exceptional species, *Pitcairnia feliciana* found in Guinea in West Africa. Most species are from tropical and subtropical regions, but they grow in many ecosystems from deserts to cloud

forests and are widespread across an area from Virginia and Texas in the United States to central Argentina and Chile. There are some species found on islands of the Pacific Ocean: *Racinaea insularis* on the Galápagos Islands, and *Greigia berteroi* and *Ochagavia elegans* on Chile's Juan Fernandez Islands.

The presence of one species in West Africa is quite curious but molecular science has determined that bromeliads arose in the Guayana Shield of South America about 100 million years ago. From there they spread



Distribution of Bromeliaceae in North, Central and South America and Guinea in western Africa

throughout the New World 16 - 13 million years ago and at least one species (*Pitcairnia feliciana*) dispersed to West Africa about 9 million years.

Alcantarea imperialis is known as a *monocarpic* plant, that is, it puts all its resources into one massive flowering and fruiting event, then dies, usually producing numerous pups at the base of the stem before its final demise.

Botanic Gardens of Sydney. [Bromeliads](#) | [Botanic Gardens of Sydney](#)

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Passport to Knowledge: [Tank Bromeliad](#)

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