**IAPT RESEARCH GRANT APPLICATION TEMPLATE**

**General Information**

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Year this degree obtained (no more than 3 years ago): 2018

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**Project Details**

Title of proposed project (200 characters max.): Systematics studies of *Psidium striatulum* complex (Myrteae, Myrtaceae)

Summary of the project (50 words, 600 characters max.): The present project seeks to investigate the phylogenetic relationships of the “*Psidium striatulum* complex” (Myrteae, Myrtaceae) and taxonomic revision of this group.

Total amount requested (max. $2000 US): 1850$

**1. Introduction**

*Psidium* Linnaeus (1753: 470) is a Neotropical genus of Myrteae-Myrtaceae that comprises about 96 species (Landrum & Kawasaki 1997, WCSP 2019), many of which used as food and in folk medicine around the world (Gutiérrez et al. 2008).

Members of the genus are recognized by fruits with many bony seed coats and a cochlear embryo with small cotyledons and a large hypocotyl (Landrum & Kawasaki 1997, Lucas et al. 2007). As none of these characters is unique to *Psidium*, the species are circumscribed by a set of shared characters, making the boundaries of some species difficult to discern, and the genus one of the most difficult to be defined within the American species of Myrtaceae (Landrum & Sharp 1989).

The monograph of Myrtaceae for “*Flora brasiliensis”* (Berg 1857–1859) is still the main contribution to the knowledge of the Brazilian species of *Psidium*, recognizing 61 species of the genus into six sections (Apertiflora, Costata, Obversifolia, Albo-tomentosa, Rigidifolia and Crenatifolia). In this contribution, the species were circunscribed by morphological characters such as leaf texture, calyx shape, and number of locules in the ovary.

Since then, several new species were described (Landrum & Sobral 2006, Landrum & Funch 2008, Soares-Silva & Proença 2008, Tuler *et al*. 2016, Tuler *et al*. 2017), and clarified species limits in some groups (Landrum 2003, 2005, 2017). However, the relationship among many species remain unclear, especially those in which many taxa are known from few collections only as in Crenatifolia section.

The section Crenatifolia sensu Berg also known as *Psidium striatulum* complex has approximately nine species : *Psidium striatulum, P. aquaticum* Benth, *P. leptocladum* O.Berg*, P. paranense* O.Berg*, P. parviflorum* Benth*., P. persicifolium* O.Berg*, P. turbiniflorum* Mart. ex DC*., P. kennedyanum* Morong*, P. tripartitum* S.Moore) with distribution between Atlantic and Pampean province (Morrone 2014). Preliminary phylogenetic analyses demonstrated that *Psidium* is monophyletic and evidencing two four clades, however, the increased sampling its necessary. None species of *Psidium striatulum* complex was included in the preliminary analyses.

The MVM herbarium (Museu Nacional de Historia Natural) is one of the most important Neotropical collections of the group because there is an important Myrtaceae specialist Diego Legrand. In addition, Uruguay is the main country with occurrence of this species.

**2. Objectives**

In order to clarify the current classification of the Neotropical genus *Psidium* (Myrtaceae) with a focus on *Psidium striatulum* complex.Therefore, the present proposal comes with the objective of carrying out fieldwork expeditions in Uruguay to collect leaf fragments for molecular phylogenetic study. Another important objective will be the analysis of the main Uruguay herbaria for the taxonomic revision of this group.

**3. Material and methods**

**3.1. Sample collections of *Psidium striatulum* complex**

The species will be collected in protected and non-protected areas in Uruguay in Pampean province (in places where some species have already been registered). Branches with flowers and/or fruits will be deposited in the RB, CAP (Brazil), MVM (Uruguay) and NY (United States) herbaria and leaf fragments will be dried in silica gel (Chase & Hills, 1991) for molecular studies.

**3.2. Visits to Uruguay herbaria**

*Psidium* vouchers will be analysed in the herbarium MVM (Montevideo), where there is an expressive collection of this group, but a visit is also intended to the herbaria MVFA MVFQ and MVJB herbaria. The morphological information obtained from the voucher analysis will be organized in a morphological matrix of characters that will be used to describe the taxa in the taxonomic revision of *Psidium striatulum* complex(section Crenatifolia sensu Berg), as well as used for the morphological phylogeny.

**5. Literature citations**

Berg O (1857-1859) Myrtaceae. *In*: Martius CPF (ed.) *Flora brasiliensis*. R Oldenbourg, Munich, Leipzig. Vol. 14, pars 1, pp. 1-656.

Gutiérrez, P. R. M., S. Mitchell, and R. V. Solis. 2008. *Psidium guajava*: A review of its traditional uses, phytochemistry, and pharmacology. Journal of Ethnopharmacology 117(1): 1-27.

Landrum &L. S. Funch. 2008. Two New Species of *Psidium* (Myrtaceae) from Bahia, Brazil. Novon 18: 74–77.

Landrum, L. R. 2003. A revision of the *Psidium salutare* complex (Myrtaceae). Sida 20(4): 1449–1469.

Landrum, L. R. 2005a. A revision of the *Psidium grandifolium* complex (Myrtaceae). Sida 21(3): 1335–1354.

Landrum, L. R. (2017). The Genus *Psidium* (Myrtaceae) in the State of Bahia, Brazil., 1–15.

Landrum LR & Kawasaki ML (1997) The genera of Myrtaceae in Brazil: an illustrated synoptic treatment and identification keys. Brittonia 49: 508-536.

Landrum L. R.&W. P. Sharp. 1989. Seed coat characters of some American Myrtinae (Myrtaceae): *Psidium* and related genera. Systematic Botany 14: 370–376.

Landrum, L.R. & Sobral, M. (2006) *Psidium cauliflorum* (Myrtaceae), a new species from Bahia, Brazil. SIDA, Contributions to Botany 22: 927–929.

Lucas, E. J., S. A. Harris, F. F.Mazine, S. R. Belsham, E. M. Nic Lughadha, A. Telford, P. E. Gasson & M.W. Chase. 2007. Suprageneric phylogenetics of Myrteae, the

generically richest tribe in Myrtaceae (Myrtales). Taxon 56: 1105–1128.

 Morrone, J.J. (2014). Biogeographical regionalization of the Neotropical Regoin. Zootaxa. 3782 (1); 01-110.

Soares-Silva, L.H. & Proença, C.E.B. (2008) A new species of *Psidium* L. (Myrtaceae) from southern Brazil. Botanical Journal of the Linnean Society 158(1): 51–54.

Tuler, A.C., Souza, M. C., Carrijo, T. T., & Peixoto, A. L. (2017). A new cauliflorous species of *Psidium* (Myrtaceae) from the Atlantic Forest. Phytotaxa, 297(1), 77–82.

WCSP—World Checklist of Selected Plant Families (2019) Myrtaceae. Available from: http://apps.kew.org/wcsp/ (accessed 25 December 2019).

**Supporting Information**

List of up to four relevant publications:

**Publication 1:** TULER, A.C; CARRIJO, T.T; PEIXOTO, A.L; GARBIN, M.L; FERREIRA, M.F.S; CARVALHO, C.R; SPADETO, M.S; CLARINDO, W.R. Diversification and geographical distribution of Psidium (Myrtaceae) species with distinct ploidy levels. TREES (BERLIN. INTERNET), v. 33, p. 1101-1110, 2019.

**Publication 2:** TULER, A.C; CARRIJO, T.T; PEIXOTO, A.L. New synonyms and typifications in *Psidium* species described by João Rodrigues Mattos (Myrtaceae): the importance of maintaining scientific collections. PHYTOTAXA, v. 400, p. 298-300, 2019.

**Publication 3:** TULER, A.C; PROENÇA, C. E. B; CARRIJO.T.T; PEIXOTO, A.L. Typification and nomenclatural notes on *Psidium cattleyanum* (Myrtaceae). TAXON, p. 1194-1198, 2018.

**Publication 4:** TULER, A.C; COSTA, C.M; CARRIJO, T.T; PEIXOTO, A.L. *Psidium pulcherrimum* (Myrtaceae, Myrteae), a new species from Bahia, Brazil. BRITTONIA, v. 72, p. 1, 2019.

Details of people who have provided recommendation letters (2 letters are required):

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