

**FLORISTIC OF ACANTHACEAE JUSS. AND VERBENACEAE J.ST.-HIL. (LAMIALES)
OF IGUAÇU NATIONAL PARK, PARANÁ, BRAZIL.**

**LISTAGEM FLORÍSTICA DE ACANTHACEAE JUSS. E VERBENACEAE J.ST.-HIL.
(LAMIALES) NO PARQUE NACIONAL DO IGUAÇU, PARANÁ, BRASIL.**

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ABSTRACT

The Iguaçú National Park (ParNa Iguaçú) is one of the few remnants of the western Paraná, composed by semideciduous forest and *Araucaria* forest. The aim of this work was to perform a floristic survey of Acanthaceae and Verbenaceae of ParNa Iguaçú. Collections were carried out monthly from August 2015 to July 2016, the individuals were deposited in the UNOP herbarium and the specimens present in the herbaria EVB, HCF, MBM and UNOP, as well as in the virtual herbaria Re flora and SpciesLink were analyzed. We recorded 20 species, 12 Acanthaceae and eight Verbenaceae, distributed in six genera each; 19 are new records for ParNa Iguaçú. *Lantana fucata* and *Bouchea fluminensis* (Verbenaceae) are new records for Paraná and *Streblacanthus dubiosus* (Acanthaceae), in Paraná, it is known only to the ParNa Iguaçú.

Keywords: Atlantic Forest. Semideciduous Forest. *Araucaria* Forest. Floristic. Taxonomy.

RESUMO

O Parque Nacional do Iguaçú (ParNa Iguaçú) é um dos poucos remanescentes do oeste do Paraná, composto de Floresta Estacional Semidecidual e Floresta de Araucária. O objetivo deste trabalho foi realizar uma listagem florística de Acanthaceae e Verbenaceae do ParNa Iguaçú. Foram realizadas coletas mensais de agosto de 2015 à julho de 2016, os indivíduos foram depositados no herbário UNOP e os espécimes presentes nos herbários EVB, HCF, MBM e UNOP, assim como nos herbários virtuais Re flora e SpeciesLink, foram analisados. Registramos 20 espécies, 12

Acanthaceae e oito Verbenaceae, distribuídas em seis gêneros cada; 19 são novos registros para ParNa Iguaçu. *Lantana fucata* e *Bouchea fluminensis* (Verbenaceae) são novos registros para Paraná e *Streblacanthus dubiosus* (Acanthaceae), no Paraná, conhecida apenas pelo ParNa Iguaçu.

Palavras-chaves: Mata Atlântica. Floresta Estacional Semidecidual. Floresta de Araucária. Florística. Taxonomia.

The National Park of Iguaçu (ParNa Iguaçu) is situated in the state of Paraná, southern Brazil, between the coordinates 25°05' to 25°41' S and 53°40' to 54°38' W, with 185,262.5 hectares of forest, being them the semideciduous forest (FES) and *Araucaria* forest (FOM), which form an ecotone (LABIAK, 2014). The climate in the ParNa Iguaçu is classified as subtropical with hot summers, without dry seasons and with very few frosts. The temperature averages vary in the hottest month superior to 22°C, and in the coldest month inferior to 18°C (ALVARES *et al.* 2013; IAPAR 2010).

Even though it is the greatest fragment of Atlantic Forest in the western Paraná, little is known of its flora, including the species of Lamiales. This order is monophyletic, reunites 24 families (APG IV, 2016) and its main characteristics are the presence of gland trichomes, oligosaccharides, parenchymatous tissue which extends from anthera connective to the locules, endosperm with conspicuous haustorium micropyle and protein inclusions in the mesophyll cell nucleus Judd *et al.* (2009). Acanthaceae and Verbenaceae are important families of Lamiales regarding Brazil diversity (FLORA DO BRASIL, 2020). In this study, we carried out the floristic survey of Acanthaceae and Verbenaceae in the ParNa Iguaçu, Paraná State, Southern Brazil.

Montly collections were performed in trails of three areas of the ParNa Iguaçu (Figure 1) from August 2015 to July 2016, using the wide patrolling method (FILGUEIRAS *et al.*, 1994) (WALTER; GUARINO, 2006). Whenever possible, the collection of three fertile branches from each individual was performed, the plants were prepared for the exsiccate confection and then deposited in the herbarium UNOP (Thiers continuamente atualizado), according to the herborization techniques (BRIDSON; FORMAN, 2010). Also, whenever possible the collected species were

photographed,

described in field, and fixed in alcohol 70% for laboratory morphologic studies.

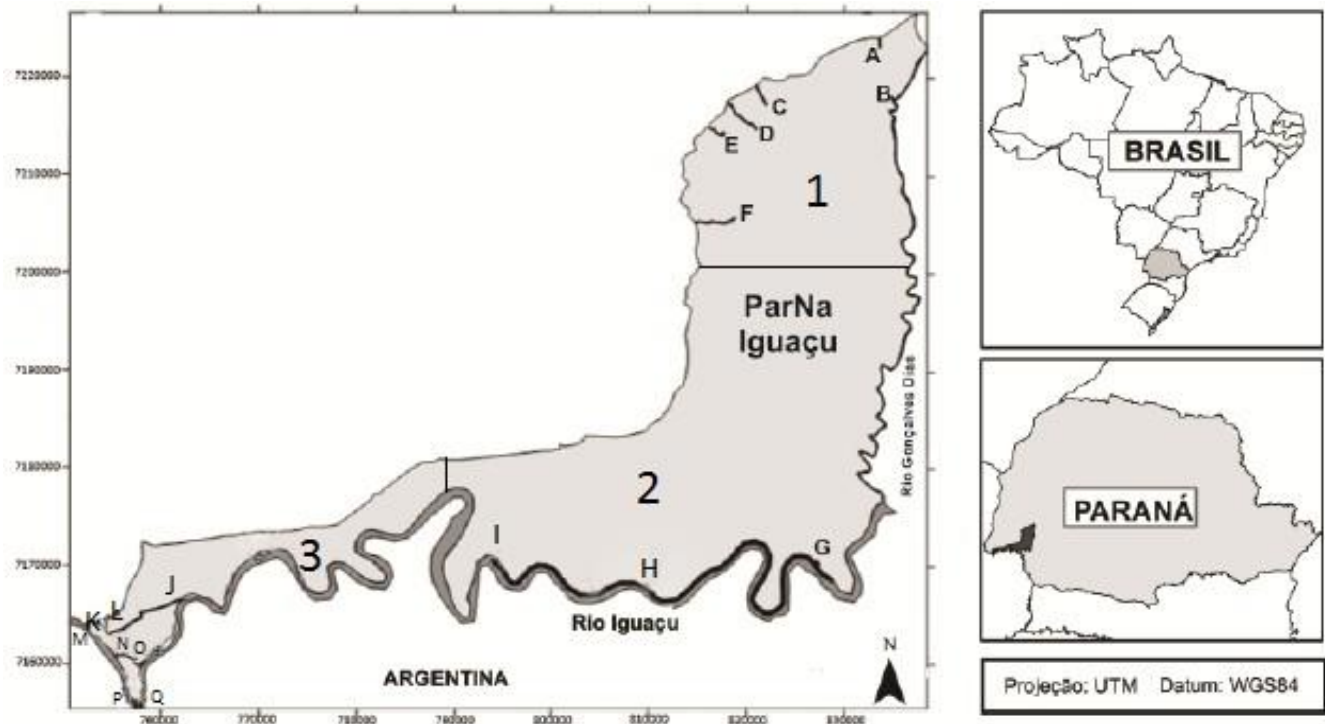


Figure 1. Collect points carried out to survey the Acanthaceae and Verbenaceae in the Iguazu National Park, Paraná State, Brazil. Céu Azul (1): A: Fazenda rio Butu; B: Nascentes do Jumelo; C: Araucárias; D: Cachoeira rio Azul; E: Manoel Gomes; F: Jacutinga. Capanema (2): G: Margens do rio Iguazu do lado brasileiro; H: Cachoeira rio Silva-Jardim; I: Ilha do Sol. Foz do Iguazu (3): J: Poço Preto; K: Represa São João; L: Antiga Usina; M: Escola Parque; N: Macuco Safari; O: Bananeiras; P: Cataratas; Q: Hidrante.

The identification was performed through specific literature (BARROSO 1991; KAMEYAMA 1995; EZCURRA 1993; EZCURRA 2002; WASSHAUSEN; WOOD 2004; KAMEYAMA 2006; SALIMENA-PIRES; GIULIETTI 1998; SILVA; LIMA 2012) and by comparison to samples of herbaria such as MBM and HCF (Thiers continuamente atualizado). The scientific and authors names followed *the International Plant Names Index* (IPNI 2016) and the Flora do Brasil 2020.

In the ParNa Iguazu 12 species of Acanthaceae and eight species of Verbenaceae native to the Atlantic Forest were found (Table 1). The genus most significant genus of the family

Acanthaceae was *Justicia* L. with five species, followed by *Ruellia* L. with three species. In the family Verbenaceae two genera were more significant with two species each, *Lantana* L. and *Verbena* L., while the other presented one species each.

Table 1. Acanthaceae and Verbenaceae recorded in the Iguaçu National Park, Paraná State, Brazil.

Family	Taxon	Voucher	Coletor
Acanthaceae	<i>Aphelandra longiflora</i> (Lindl.) Profice	UNOP8606	Hammes, J.K. et al.105
	<i>Hygrophila costata</i> Nees & T. Nees	UNOP3956	Siqueira E.L. et al.1779
	<i>Justicia brasiliiana</i> Roth	UNOP8600	Hammes, J.K. et al.70
	<i>Justicia carnea</i> Lindl.	UNOP8607	Hammes, J.K. et al.106
	<i>Justicia comata</i> (L.) Lam.	MBM36407	Hatschbach, G.11202
	<i>Justicia lythroides</i> (Nees.) V.A.W. Graham.	UNOP8631	Hammes, J.K. et al.156
	<i>Justicia ramulosa</i> (Morong) C. Ezcurra	UNOP8621	Hammes, J.K. et al.132
	<i>Ruellia angustiflora</i> (Nees) Lindau ex Rambo	UNOP8633	Hammes, J.K. et al.119
	<i>Ruellia brevifolia</i> (Pohl) C.Ezcurra	UNOP8595	Hammes, J.K. et al.81
	<i>Ruellia erythropus</i> (Nees) Lindau	HCF17709	Caxambu, M.G.6768
	<i>Stenandrium mandioccanum</i> Nees	UNOP5530	Temponi, L.G.672
	<i>Streblacanthus dubiosus</i> (Lindau) V.M.Baum	UNOP8596	Hammes, J.K. et al.71
	Verbenaceae	<i>Aloysia virgata</i> (Ruiz & Pav.) Juss.	UNOP3869
<i>Bouchea fluminesis</i> (Vell.) Moldenke		UNOP8574	Hammes, J.K. and Toderke, M.L.91
<i>Lantana camara</i> L.		UNOP8569	Hammes, J.K. and Toderke, M.L.95
<i>Lantana fucata</i> Lindl.		MBM43012	Hatschbach, G.3750
<i>Lippia brasiliensis</i> (Link) T.R.S.Silva		UNOP8570	Hammes, J.K. et al.107
<i>Stachytarpheta cayennensis</i> (Rich.) Vahl		UNOP8572	Hammes, J.K. and Toderke, M.L.90
<i>Verbena bonariensis</i> L.		MBM297809	Labiak, P. 3362
<i>Verbena litoralis</i> Kunth		UNOP8573	Hammes, J.K. and Toderke, M.L.94

Three species of Acanthaceae are threatened of extinction, one is considered vulnerable, *Justicia ramulosa* and two are categorized as endangered of extinction *Justicia comata* and *Streblacanthus dubiosus* (CNCFlora, 2016).

Streblacanthus dubiosus, in the State of Paraná, was only recorded inside the ParNa Iguaçu and *Justicia carnea* occurs in other areas of the state, but, in the ParNa Iguaçu it was only found in the area of Foz do Iguaçu (CNCFlora, 2016).

In the floristic studies of the state, these families have been very poorly addressed, as for

example the work of Liebsch and Acra (2002), that only found *Lippia brasiliensis* (Verbenaceae) from these families, which also occurs in the ParNa Iguaçu. Souza and Monteiro (2015) found only *Lantana camara* and *Lippia alba* (Verbenaceae), in common to this area of study.

In the study of Silva (2011) only the species *Ruellia angustiflora*, belonging to the family Acanthaceae and two species of Verbenaceae, *Aloysia virgata* and *Lantana camara* were found, also in common with ParNa Iguaçu.

Some authors while studying the non-arboreal component also found few species of these families like Saka and Lombardi (2016) which found *Hygrophila costata*, *Stachytarpheta cayennensis* and *Verbena litoralis*, species also in common with ParNa Iguaçu.

ParNa Iguaçu presents a high diversity of Acanthaceae and Verbenaceae, compared to other studies carried out in the Atlantic Forest. The presence of species threatened with extinction or with restricted occurrence, demonstrates the importance of the Iguaçu ParNa in the conservation of the biodiversity of the interior vegetal formations, as well as emphasizes the importance and the necessity of studies with non-arboreous taxa.

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