FLORISTIC AND PHYTOSOCIOLOGICAL SURVEYS REALIZED IN BAURU AND BORDERLINES CITIES IN LAST 20 YEARS

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ABSTRACT

The objective of this study was to compile the floristic and phytosociological surveys conducted in Bauru and borderlines cities in the last 20 years. It was possible to verify the relevance of the "Leguminosae" in the analyzed areas, in the same way that the species of "Copaifera langsdorffii" Desf., "Vochysia tucanorum" Mart. and "Ocotea pulchella" Mart.. Most authors concentrated theirs survey in the superior strata of vegetation, therefore more studies on sub-bosque species, which are part of this vegetation, is essential. The great phytophysiognomic variety occurring in this region is an alert for the need of further studies and conservation of this incommensurable genetic richness.

KEY WORDS*: floristic; phytosociology; Bauru region*

INTRODUCTION

Quantification and qualification of vegetation has the aim to classify and, most of all, to understand the studied habitat, providing information that allow its adequate handling (STRANG, 1970).

Such type of study become more common in Bauru and surroundings in the past years, although less frequent than really needed due to the present condition of this sort of vegetation.

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According to the Forest Department (2002), an organ of the Secretary for the Environment of the State of Sao Paulo, there remains only 99,390 ha of native areas in the region of Bauru. One should remember that, in the beginning of the 70's the area was near 1,572,000ha (SERRA FILHO et. al., 1974).

Taking these data into consideration it is possible to expect that, by the end of the present decade, there will remain only the areas preserved by legal protection, which are inexpressive to assure the preservation of the local biodiversity.

The aim of the present study is to review the floristic and phytosociologic inventories made in the last 20 years in Bauru and in the surroundings municipalities.

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CLIMATE AND SOIL

The most recent data on climate for the region of Bauru were presented by Bertoncini (1996), which was characterized as Cwa after Köppen – mesothermic with dry winter and rainy summer. The average precipitation is 1,464 mm/year, the mean maximal temperature is 27.7ºC whereas average minimal is 16.0ºC. Highest temperatures occurs in February and March and the lowest in June and July. The climate data refers to a period of 30 years for precipitation (1963-1993) and of 20 years for temperature (1974-1993) obtained by Bertoncini in the Meteorological Station of Piata, in Agudos, Sao Paulo.

Soils in the region pertains to sandy phase dark red latosoil unit (COMISSAO DE SOLOS, 1960).

HISTORIC, PLACES AND FEATURES

In the 80's appeared the first qualitative and quantitative studies on the regional phytocenosis but only in the next decade these studies really become more intense.

For the cerrado and its phytofisionomic variation there are studies by Ferracini et al.(1983), Cavassan (1990), Koch et al. (1990) and Christianini and Cavassan (1998) for Bauru and Bertoncini (1996), Pachoal and Montanholi (1997) and Fabricante (2002) for the municipality of Agudos.

For Semidecidual Stational Forest (SSF) there are studies by Cavassan (1982), Cavassan et al. (1984) in Bauru and Camargo (1999) and Christianini (1999) in Agudos.

There are also studies by Coral et al. (1990), Cavassan et al. (1993) and Paschoal (1994) on transition areas from Cerradão and SSF, a study by Paschoal and Cavassan (1999) on Hygrophyle Latifoliate Forest (HLF), by Miranda (2000) on ciliar forest. The later was conducted in the municipality of Avai, the remaining in Agudos.

TABLE – 1 Partial list of published studies on the regional phytocenosis depicting authors and year of publication, type of study and studied strata.

Autor/year	Character	Stratus*
Cavassan (1982)	Structural	Arb.
Ferracini et al. (1983)	Floristic and structural	arbs.-arb.
Cavassan et al. (1984)	Structural	arb.
Cavassan (1990)	Floristic and structural	arb.
Koch et al. (1990)	Florístico	arbs.-arb.
Coral et al. (1991)	florístico	arbs.-arb.
Cavassan et al. (1993)	Structural	arbs.-arb.
Paschoal (1994)	Structural	arbs.-arb.
Bertoncini (1996)	Floristic and structural	arbs.-arb.
Paschoal e Montanholi (1997)	Florístico	arbs.-arb.
Christianini e Cavassan (1998)	Florístico	herb.-sub.
Camargo (1999)	Floristic and structural	arbs.-arb.
Christianini (1999)	Floristic and structural	arb.
Paschoal e Cavassan (1999)	Floristic and structural	arb.
Miranda (2000)	Floristic and structural	arbs.-arb.
Fabricante (2002)	Floristic and structural	arbs.-arb.

*arb. = arboreus arbs.-arb = arbustive-arboreus; herb.-sub = herbaceous-sub-arbustive;

All these studies but that of Christianini and Cavassan (1998) refer to the superior strata of the vegetation (TABELA 1).

There should be other studies on this region that were not mentioned both for not being published or difficult to retrieve. Others have not been mentioned due to different objectives such as identification of specimens at the border of paths aiming to elaborate programs for Environmental Education (PASCHOAL; CORREA, 1996; 1998), or studies aiming to cover a sole taxon: *Bromeliaceae* (SOUZA, 1993), *Apocynaceae* (KOCH, 1994), *Orchydaceae* (MARTINS; CAVASSAN, 1996) and *Melastomataceae* (ASSIS, 1997).

RELEVANT FAMILIES AND SPECIMENS

To the construction of the next tables on most relevant families and species, in the floristic type studies (TABLE 1) it was taken

into consideration the percentage of individuals by family (for family) and the percentage of individuals by species (for species).

In what regards the studies of structural type (TABLE 1) it was considered the Index of Value of Importance (IVI) of families and species.

In TABLE 2, showing the three most relevant families of each cited study, it is stressed, apart from the phitophisionomy, the leguminoses (*Mimosaceae*, *Fabaceae* and *Caesalpiniaceae*), besides the families *Myrtaceae, Rubiaceae, Lauraceae* and *Vochysiaceae.*

TABLE 2 - Partial list of authors/year and the most relevant families.

Author / year	Most relevant families
Cavassan (1982)	*Mimosaceae*, *Fabaceae* e *Apocynaceae*
Ferracini et al. (1983)	*Vochysiaceae*, *Rubiaceae* e *Annonaceae*
Cavassan et al. (1984)	*Mimosaceae*, *Fabaceae* e *Apocynaceae*
Cavassan (1990)	*Caesalpiniaceae*, *Rubiaceae* e *Vochysiaceae*
Koch et al. (1990)	*Leguminosae**, *Rubiaceae* e *Vochysiaceae*
Coral et al. (1991)	*Myrtaceae*, *Lauraceae* e *Fabaceae*
Cavassan et al. (1993)	*Lauraceae*, *Vochysiaceae* e *Myrtaceae*
Paschoal (1994)	*Lauraceae*, *Vochysiaceae* e *Myrtaceae*
Bertoncini (1996)	*Vochysiaceae*, *Myrcinaceae* e *Ochnaceae*
Paschoal e Montanholi (1997)	*Myrtaceae*, *Malpighiaceae* e *Asteraceae*
Christianini e Cavassan (1998)	*Rubiaceae*, *Myrtaceae* e *Melastomataceae*
Camargo (1999)	*Mimosaceae*, *Apocynaceae* e *Sterculiaceae* (1)
	Fabaceae, *Sterculiaceae* e *Myrtaceae* (2)
Christianini (1999)	*Caesalpiniaceae*, *Rubiaceae* e *Lauraceae* (3)
	Rubiaceae, *Euphorbiaceae* e *Caesalpiniaceae* (4)
Paschoal e Cavassan (1999)	*Clusiaceae*, *Anacardiaceae* e *Magnoliaceae*
Miranda (2000)	*Mimosaceae*, *Euphorbiaceae* e *Meliaceae*
Fabricante (2002)	*Myrtaceae*, *Apocynaceae* e *Asteraceae*

* this author has used the classification of Cronquist (1988); (1) - base of the "cuesta"; (2) – top of the "cuesta"; (3) – DAP inclusion; (4) – fuste inclusion.

The success of leuguminoses in the colonization of these sites may be linked to its capability to associate to micorrizic fungi, which favors to obtain nitrogenic nutrients (CAVASSAN, 1982; MARTINS, 1991), since these nutrients are scarce in arenitic soils such as in the studied region (CORAL et al., 1991; CAVASSAN et al., 1993).

Myrtaceae, *Rubiaceae* and *Lauraceae*, as cosmopolitan families (JOLY, 1998), are mentioned by Leitão Filho (1982) as im-

portant members for the floristic diversity in forests of the State of Sao Paulo.

Myrtaceae still is, according to Castro (1994 apud CAVASSAN 2002), in what concerns the cerrado area, the most representative family in the arbustive-arboreus stratus with 198 species.

Vochysiaceae shows a more modest distribution occurring mainly in Brazilian savanic formations (GOODLAND; FERRI, 1979; JOLY, 1998). Back to the cerrado, this family, together with *Rubiaceae*, are of outstadning ecologic importance since they are important accumulators of alluminium. This ion has great acuity in soils of this sort, being its main role to increase the acidity that, in its turn, provokes nutritional deficiency.

As can be seen in TABLE 3, there is a considerable variation among the most important species in the various studied phytocenosis.

TABLE 3 - Partial list of authors, year of publication and the respective most relevant species.

Author / year	Most relevant species
Cavassan (1982)	*Acacia polyphylla* DC., *Chorisia speciosa* A. St.-Hil. e *Aspidosperma polyneuron* Müll. Arg.
Ferracini et al. (1983)	*Vochysia tucanorum* Mart., *Palicourea rigida* Kunth e *Xilopia aromática* Mart.
Cavassan et al. (1984)	*Acacia polyphylla* DC., *Chorisia speciosa* A. St.-Hil. e *Aspidosperma polyneuron* Müll. Arg.
Cavassan (1990)	*Copaifera langsdorffii* Desf., *Coussarea hidrangeaefolia* B. & HooK. e *Siparuna guianensis* Aubl.
Koch et al. (1990)	*Copaifera langsdorffii* Desf., *Coussarea hidrangeaefolia* B. & HooK. *e Vochysia tucanorum* Mart.
Coral et al. (1991)	*Ocotea pulchella* Mart., *Rapanea guianensis* Aubl. e *Myrciaria floribunda* (West ex Willd) O. Berg
Cavassan et al. (1993)	*Ocotea pulchella* Mart., *Copaifera langsdorffii* Desf. e *Vochysia tucanorum* Mart.
Paschoal (1994)	*Ocotea pulchella* Mart., *Copaifera langsdorffii* Desf. e *Vochysia tucanorum* Mart.
Bertoncini (1996)	*Vochysia tucanorum* Mart., *Rapanea umbellata* (Mart.) Mez e *Ouratea spectabilis* Engl.
Paschoal e Montanholi (1997)	*Diospyros hispida* DC., *Coussarea hidrangeaefolia* B. & HooK. e *Gochnatia polymorfa* (Less.) Cabrera
Christianini e Cavassan (1998)	*Myrcia lingua* (O. Berg) Mattos & D. Legrand, myrtaceae 1 e *Ocotea* sp.
Camargo (1999)	*Parapiptadenia rigida* (Benth.) Brenan, *Tabernaemontana catharinensis* A. DC. e *Gazuma ulmifolia* Lam.(1) *Gazuma ulmifolia* Lam., *Machaerium nyctitans* (Vell.) Benth. e *Campomanesia guaviroba* (DC.) Kiaersk.(2)

TABLE 3 - Partial list of authors, year of publication and the respective most relevant species. (continued)

Author / year	Most relevant species
Christianini (1999)	*Copaifera langsdorffii* Desf., *Coussarea contracta* (Walp.) Müll. Arg.e *Myrcia multiflora* (Lam.) D.C. [3]
	Coussarea contracta (Walp.) Müll. Arg., *Copaifera langsdorffii* Desf. e *Actinostemon concepcionis* (Chodat & Hassl.) Hochr.[4]
Paschoal e Cavassan (1999)	*Calophyllum brasiliense* Cambess., *Tapirira guianensis* Aubl. e *Talauma ovata* A. St.-Hil.
Miranda (2000)	*Inga vera* Willd., *Sebastiania commersoniana* (Baill.) L.B. Sm. & Downs e *Guarea macrophylla* Vahl
Fabricante (2002)	*Campomanesia pubescens* Berg., *Tabernaemontana australis* Muell. Arg. e *Gochnatia barrosi* Cabrera

(1) - base of the "cuesta"; (2) – top of the "cuesta"; (3) – DAP inclusion; (4) – fuste inclusion

Undoubtedly, in each area some species exert a major influence in the environment than others. However, it seems clear the importance of *Copaifera langsdorffii* Desf*., Vochysia tucanorum* Mart. and *Ocotea pulchella* Mart. in the region not only by the high statistical indexes (frequency, density, IVI, etc) referred in some studies but also due to its occurrence in the majority of the studied sites.

It is important to take into consideration that the various criteria of inclusion and the sample methods used in the mentioned studies may possible be the reason for some of the differences among the obtained results. In the other hand, these differences are quite justifiable due to the presence of distinct phytophisionomies in a relatively small area.

FINAL CONSIDERATIONS

Despite the reasonable number of studies there is still need for more information on the vegetation, mainly in what concerns the species of under-bosky such as sub-arbustes, terricole herbs, lianes and epiphytes. These individuals are of relevant value to the maintenance of the sinusies they belong to, increasing the biological diversity and influencing in the interactive balance among species.

Undoubtedly, in considering the restoration of a degraded area it should be bore in mind to proceed in the most faithful way in what regards the original formation. Therefore, the reintegration of such

individuals is necessary and, in this connection, the knowledge of their characteristics is of primary importance.

Although most of the mentioned studies were conducted in Bauru and Agudos, it is possible to conclude that the regions is an area of ekotone between cerrado and FES, a fact that reinforce the importance of the knowledge and preservation of this endless genetic richness. It is opportune to remember that in less than 30 elapsed years the vegetation in this region was reduced in 94%.

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