

# Floral preferences of the polistine wasp *Polistes versicolor versicolor* Olivier, 1792 (Hymenoptera: Vespidae: Polistinae, Polistini) in Santa Cruz do Sul, Southern Brazil

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The study of plant-pollinator interactions may reveal many data of ecological and evolutionary interest, such as for example community organization and feeding habit patterns (Heithaus, 1979a; Bawa, 1990). Many works about plant-pollinator interactions have been carried out in tropical and temperate regions in the last 50 years, showing that bees are the major group of flowering plant visitors and pollinators (MICHENER, 1954; HEITHAUS, 1979A,B,C; VIEIRA & CARVALHO-OKANO, 1996; WILMS et al., 1997). Therefore, studies on other taxonomic groups of flower visiting insects of the order Hymenoptera are rare or lacking (ITINO ET AL. 1991; ENDRESS, 1994; PROCTOR ET AL., 1996; MOMOSE ET AL. 1998). Heithaus (1979a) studied the plant visitor communities in Costa Rica, and showed that wasps of the family Vespidae (Polistinae and Eumeninae) are a very important part of these communities, preferring flowers with shorter corollas and shorter floral cups than do bees. Silberbauer-Gottsberger & Gottsberger (1988) cited 41 plant species visited by vespids in the Brazilian cerrado and Santos (2000) showed that 13 species of the family Vespidae (Polistinae) are visitors of 39 flowering plants in the Brazilian caatinga, Bahia State. In addition to that, Richards (1962) reviewed the literature on flower visiting by Masarinae wasps, which are known to entirely provision their nests with pollen and nectar, as bees do (Gess, 1996). Gess (1968, 1973) and Gess & Gess (1980, 1986) provides records of masarine wasps as clearly established pollinators in Southern Africa, and Garcete-Barrett (1999) and Garcete-Barrett & Carpenter (2000) published data about the Masarinae/flower association in South America. First data published about wasp pollination in southern Brazil by Hermes & Köhler (2006) showed that the majority of wasp are generalist visitors of flowering plants because of the permanent food supply of the perennial colonies.

In the study area the genus *Polistes* (Hymenoptera, Vespidae) represents the most common genus of social wasps collected from flowering plants. *Polistes* is the only cosmopolitan genus among social wasps and is represented by more than 200 described species (Carpenter, 1996a). From Brazil, 38 species of this genus are recorded, all of them belonging to the subgenus *Aphanilopterus* (Carpenter & Marques, 2001; Carpenter, 1996b).

*Polistes* is known for its independent colony foundation. The relatively small colonies are readily observed,

manipulated, and also widely used for biological control of pests in several kinds of crops (RABB & LAWSON, 1957; PREZOTO et al, 1994). Besides, the food of the adult social wasps is based on honeydew, fruit juices, honey, water and nectar (Hunt et al., 1982; Carpenter & Marques, 2001). While feeding on nectar, social wasps can contribute to the pollination of many flowering plants (FAEGRI & VAN DER PIJL, 1979; ENDRESS, 1996).

This study aimed to improve the knowledge about the floral preferences of the polistine wasp *Polistes versicolor versicolor* Oliver, 1792, the most common paper wasp of the genus *Polistes* in the study site. A list of the flowering plants visited by this wasp species is given.

The field work was carried out in a preserved area of the Green Belt of the City of Santa Cruz do Sul, Rio Grande do Sul State, Southern Brazil (29°43'00"S – 52°25'00"W), including an area of 465 ha with a length of 32 km. The climate in the study area is characterized by high precipitation and temperature means of 15°C in the winter and 20°C in the summer. The arboreal vegetation is characterized by species of the Atlantic forest and species of the central region of the Rio Grande do Sul State.

Between September 2001 and March 2007, social wasps were collected with insect nets following the methodology described in Sakagami et al. (1967), during the foraging period of workers on flowers.

The collected insect material was prepared in the Laboratory of Entomology of the University of Santa Cruz do Sul. The wasps were identified by the authors with the keys provided in Richards (1978). The flowering plants were identified by specialists of the Laboratory of Botany of the same university.

In this study 191 individuals of *Polistes versicolor versicolor* were registered visiting 20 species of flowering plants, belonging to 11 different plant families (Table 1).

The plant family Asteraceae was the most represented, with 8 plant species visited by 42 individuals (7/42), followed by Anacardiaceae (2/128), Apiaceae (2/7), Fabaceae (2/3), Lamiaceae (1/1), Malvaceae (1/3), Nyctaginaceae (1/2), Solanaceae (1/2) and Meliaceae, Rutaceae and Verbenaceae (1/1).

The polistine wasp *Polistes versicolor versicolor* was more attracted to the species of the plant family Asteraceae, due to their large nectar resource, which is concealed at a depth of some millimeters only, the presence of yellow and white flower coloration and variously produced shine or luster. The wasp preference

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for species of this family was also observed by Silberbauer-Gottsberger & Gottsberger (1988) in the Brazilian Cerrado and Vogel (1954) in South Africa. The high number of individuals collected from flowering individuals of *Schinus terebinthifolius* Raddi (Anacardiaceae) occurred because of the mass flowering character of this specie in May and June, offering the unique large collecting recourses for pollen and nectar in this period.

## ACKNOWLEDGEMENTS

Thanks to Marcel Gustavo Hermes (UFPR), Bolivar R. Garcete-Barrett (MNHPY) and James M. Carpenter (AMNH) for critical comments on earlier versions of the manuscript. Also thanks to Jair Putzke (UNISC) and João A. C. Silva (UNISC) for the plant identification, and Tatiana Straatmann and Alexandre Somavilla for separation of wasp material. Thanks to the CNPq for financial support: Edital Universal 2005, 474102/04-1.

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Table 1: Plant families/species and visitation frequency during observation month.

<b>Family / Specie</b>	<b>Month (number of wasp individuals)</b>
<b>ANACARDIACEAE</b> <i>Astronium balansae</i> Engl. <i>Schinus terebinthifolius</i> Raddi	Oct (1) Mar (3), May (87), Jun (12), Sep (3), Oct (10), Nov (11), Dec (1)
<b>APIACEAE</b> <i>Eryngium horridum</i> Malme <i>Eryngium megapotamicum</i> Malme	Jan (5) Feb (2)
<b>ASTERACEAE</b> <i>Baccharis phytumoides</i> (Less.) DC. <i>Baccharis trimera</i> (Less.) DC. <i>Cosmos bipinnatus</i> Cav. <i>Elephantopus mollis</i> Kunth. <i>Mikania cordifolia</i> (L.f.) <i>Vernonia florida</i> Gardner <i>Vernonia oxyodonta</i> Malme <i>Vernonia polyanthes</i> Less.	Mar (6), Apr (17) Fev (1) Mar (1) Feb (1), Nov (1) Mar (4), Apr (5) Jan (1) Feb (3) Apr (2)
<b>FABACEAE</b> <i>Desmodium</i> sp. Desv. <i>Mimosa bimucronata</i> (DC.) Kuntze	Feb (2) Dez (1)
<b>LAMIACEAE</b> <i>Ocimum selloi</i> BENTH.	Nov (1)
<b>MALVACEAE</b> <i>Sida rhombifolia</i> L.	Feb (2), Oct (1)
<b>MELIACEAE</b> <i>Trichilia clausenii</i> C. DC.	Oct (1)
<b>NYCTAGINACEAE</b> <i>Bougainvillea glabra</i> Choisy	Feb (2)
<b>RUTACEAE</b> <i>Citrus cinensis</i> (L.) Osbeck	Set (1)
<b>SOLANACEAE</b> <i>Solanum acerosum</i> Sendt.	Oct (1), Nov (1)
<b>VERBENACEAE</b> <i>Verbena bonariensis</i> L.	Jan (1)