RESOURCE PARTITIONING AND INTERSPECIFIC COMPETITION AMONG COEXISTING SPECIES OF GUANS AND TOUCANS IN SE BRAZIL

by

JUAN CARLOS GUIX1,*, XAVIER RUIZ1 and LLUIS JOVER2

(1 Departament de Biologia Animal (Vertebrats), Facultat de Biologia, Universitat de Barcelona, Av. Diagonal 645, E-08028 Barcelona, Spain. E-mail: jialves@pangea.org; 2 Departament de Salut Pública (Bioestadística), Facultat de Medicina, Universitat de Barcelona, Casanovas 143, E-08036, Spain)

ABSTRACT

Between 1987 and 1998 fruit consumption and habitat use of six syntopic species of guans and toucans were studied in two Atlantic rainforest areas of southeastern Brazil: the Paranapiacaba forest fragment (140,000 ha) and the Parque Estadual da Ilha do Cardoso (22,500 ha). These two areas cover an altitudinal gradient of 0 to 1,095 m. Pipile jacutinga and the larger species of toucans (Ramphastos vitellinus and R. dicolorus) inhabit the upper levels of the forest (canopy and emergent trees), whereas Penelope obscura and the smaller toucanets (Baillonius bailloni and Selenidera maculirostris) mostly inhabit middle levels (subcanopy) and understorey. Diet composition (fruit) differed among guans and toucans and also among guan species. P. jacutinga and P. obscura tended to forage more on the fleshy fruits of Lauraceae and Myrtaceae trees, respectively, while toucans (especially B. bailloni) fed largely on palm fruits (Arecaceae). Potential congeneric competitors in the study areas are Ramphastos vitellinus ariel and R. dicolorus. We suggest that R. v. ariel recently colonized (end of the Quaternary period) the coastal Atlantic rainforest of Brazil, coming from the Amazonian rainforest.

KEY WORDS: niche overlap, resource partitioning, frugivory, habitat use, competition, Cracidae, Ramphastidae.

INTRODUCTION

Guans (family Cracidae) and toucans (family Ramphastidae) are primarily frugivorous birds. Together with cebid monkeys (family Cebidae) and phyllostomid bats (family Phyllostomidae), usually they are the main dispersers of large seeded fruits in wet Neotropical forests (WHEELWRIGHT et al., 1984; ESTRADA & FLEMING, 1986; REMSEN et al., 1993; GUIX, 1995).

Although most guan and toucan species are large and conspicuously colored, they are among the least known birds of the Americas (SICK,

* To whom correspondence should be sent.

© Koninklijke Brill NV, Leiden, 2001
1993; DEL HOYO, 1994; Galeotti et al., 2000). They usually cohabit a
given area, sharing both space and food.

Two species of guans (Pipile jacutinga and Penelope obscura) and
four species of toucans (Ramphastos vitellinus, R. dicolorus, Baillonius
bailloni and Selenidera maculirostris) live syntopically in the Serra do
Mar mountain chain, southeastern Brazil (Guix, 1995; 1997). All of them
are strictly forest dwelling species and use their poor flying abilities in
several forest strata.

Although the body mass of toucans is less than half of that of guans,
they usually feed on the same fruit species. Fruit are generally swallowed
whole, the seeds are defecated or regurgited whole. Gape width, rather
than body size, determines the range of fruit sizes that can be swallowed
(Wheelwright, 1985). As the six coexisting species have similar gape
sizes (J.C. Guix, unpublished data), the general availability of fruit is
similar.

The aim of this study is to compare habitat and resource use among
syntopic species of guans and toucans with a similar gape width. Two
main questions are addressed: 1) whether the species partition space and
food and 2) if so, whether such partitioning occurs between species with
similar (same family) or distinct morphological characteristics (different
families).

STUDY AREAS AND METHODS

Fruit consumption and use of space of syntopic species of guans and tou-
cans were studied in two Atlantic rainforest areas located in the southern
region of the State of São Paulo, southeastern Brazil: the Paranapiacaba
forest fragment and the Parque Estadual da Ilha do Cardoso. Although we
were unable to find B. bailloni in the Parque Estadual da Ilha do Cardoso,
the species was recorded by a resident ornithologist up to the end of 1991
(P. Martuscelli, pers. comm.).

The Paranapiacaba forest fragment is a 140,000 ha area covered by
mature and secondary Atlantic rainforest and is located in the Serra de
Paranapiacaba (24°15'S, 48°05'W), a section of the Serra do Mar moun-
tain chain (fig. 1). It comprises four contiguous natural parks (Parque
Estadual de Carlos Botelho, Parque Estadual Intervales, Parque Estadual
Turístico do Alto Ribeira, and Estação Ecológica de Xitué) and private
properties. Elevation ranges from 22 to 1095 m.

The Parque Estadual da Ilha do Cardoso is a 22,500 ha area, which is
located on Cardoso island (25°10'S, 48°00'W) close to the boundary of
the States of São Paulo and Paraná (fig. 1). Elevation ranges from 0 to