

rhacophorids (Coe 1967. *Nature* 214:112–113; Coe 1974. *J. Zool. Soc. Lond.* 172:13–34; Fukuyama 1991. *An. Behav.* 42:193–199; Feng and Narins 1991. *Naturwissenschaften* 78:362–365; Jennions et al. 1992. *Anim. Behav.* 44:1091–1100; Kasuya et al. 1996. *Research. Pop. Ecol.* 38[1]:1–10), one bufonid (Kaminsky 1997. *Herpetol. Rev.* 28:84), one myobatrachid (Roberts et al. 1999. *Anim. Behav.* 57:721–726), two leptodactylids (Prado and Haddad 2003. *J. Herpetol.* 37:354–362), and four hylids in the subfamily Phyllomedusinae (Pyburn 1970. *Copeia* 1970:209–219; Roberts 1994. *J. Herpetol.* 28:193–199; Wogel et al. 2005. *J. Nat. Hist.* 39:2035–2045). Here we describe the occurrence of simultaneous polyandry in another phyllomedusine, *Phyllomedusa distincta*.

Observations were made in two permanent ponds located in remnants of Atlantic rainforest, Brazil. From September 1991 to February 1992, the study was conducted in the Parque Estadual Carlos Botelho, Municipality of Sete Barras, State of São Paulo (24°12'S; 47°55'W), and from August 2001 to October 2003, observations were made in the Municipality of Guaramirim, State of Santa Catarina (26°27'S; 49°00'W).

The observed pairs deposited egg clutches wrapped in leaves above water. During the observations in the Parque Estadual Carlos Botelho, three male *P. distincta* were observed trying to fertilize the eggs of one female. In other occasions, we observed single

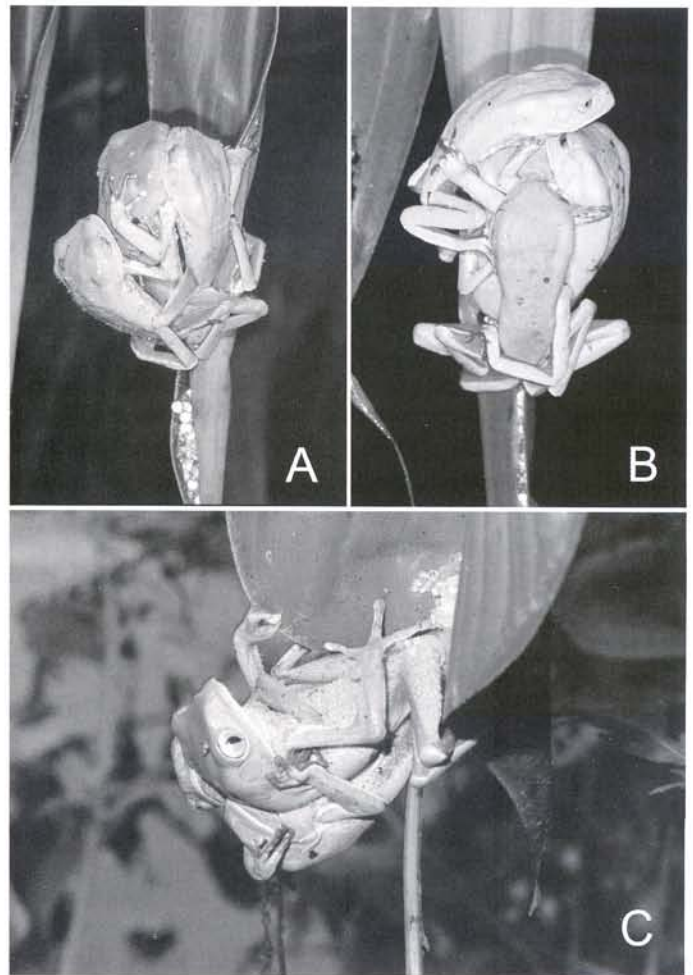


FIG. 1. Multi-male spawning in *Phyllomedusa distincta*. A) One female with two males; B) one female with three males; and C) a female dislodged from the leaf by two males.

PHYLLOMEDUSA DISTINCTA (Leaf Frog). **MULTIMALE SPAWNING.** Multimale spawning in anurans is rarely reported. To date, simultaneous polyandry has been directly observed in six

males trying to join a pair already in amplexus, but they were not successful. Multi-male spawning in *P. distincta* was observed four times during the study conducted in the Municipality of Guaramirim. In three occasions (August 2001, September 2002, and October 2003) we observed two males spawning with one female (Fig. 1A). In September 2002, we saw three males with a female (Fig. 1B). In these four cases, after entering in amplexus, the female carried the male to an appropriate site to spawn, generally 3–4 m from the calling site. Additional males usually join the pair just before spawning begins; we have never seen a female transporting more than a single male on her back. The opportunistic males try to position their cloacae close to the eggs that are being deposited. After spawning was complete, the males slowly went away and the female remained to conclude the leaf sealing by depositing empty egg capsules to glue the leaf margins and to protect the eggs against desiccation. These clutches were monitored and egg development and hatching succeeded in three of the cases, including that with three males. However, in one occasion, when a female was spawning with two males, their weight disturbed the female by pulling her down and prevented her from sealing the leaf (Fig. 1C). The result was that almost the entire clutch desiccated. Furthermore, simultaneous polyandry was observed several times at Guaramirim, including one observation with four males with one female. The low number of cases of multimale spawning reported for anurans suggests that in general, the costs involved are higher than the advantages (Lodé and Lesbarrères. *Naturwissenschaften* 91:44–47). However, the advantages for the females could be to increase the chance of fertilization or the genetic diversity of offspring. For the opportunistic males, polyandry could increase the chances of fertilizing at least some eggs. Thus, mating with more than one male may be more common for anurans than reported (Roberts et al. 1999. *Anim Behav.* 57:721–726) and the recent increase in the number of cases reported seems to confirm this (e.g., Prado and Haddad, *op. cit.*; Wogel et al., *op. cit.*).

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