

Use of a Portable Platform for Observations of Tropical Forest Canopy Animals

The recent application of mountain-climbing techniques and equipment to gain access to the upper tree canopy of tropical rainforests has expanded the ability of biologists to observe and understand one of the most complex and diverse communities on earth (Perry 1984). Permanent and semipermanent canopy structures such as towers, platforms, catwalks, and "canopy webs" within the near tall trees have been used to monitor the vertical stratification of forest microclimatology and biota (Bates 1944, McClure 1966, Mull & Liat 1970, Medway 1972, Perry & Williams 1981). These structures, however, are not portable and do not lend themselves to studies of animal behavior in extensive areas of the canopy, as their installment requires a large investment of effort within particular tree crowns (e.g., Sutton 1983). I report here on a portable platform and associated methods that facilitate long-term observations of canopy animal behavior and have been successfully used in behavioral studies of Neotropical tropical montane avifauna (Nadkarni 1986).

I use single-rope tree-climbing techniques described by Perry (1978) and Mitchell (1982) to climb into the crowns of up to 25-m-tall trees. First, I shoot a 20-lb test nylon monofilament fishing line over robust branches with a "Mastercaster." This consists of a powerful slingshot ("American Brand Wrist-rocket," available from sporting goods stores) mounted with plastic brackets onto a 40-cm aluminum rod, with a standard spinning reel mounted on the underside of the rod. This allows for easy line deployment and retrieval. After pulling up a 0.5-cm parachute cord, followed by a standard 9-mm climbing rope, and tying it off at the base of the tree, I climb the rope itself with "Jumar" ascenders to a suitable branch within the canopy.

To carry out observations of animal behavior within the canopy, I use a collapsible cot that is attached at each corner and at mid-cot points with six lines of 2.5-cm-wide nylon webbing to a single point that can be tied around a single horizontal branch. This hanging cot was originally designed for use by rockface climbers and is manufactured by Sole Survivors, Inc. (4183 North-South Bank, Oxnard, California 93030, U.S.A.) for a retail price of U.S. \$250. The bed itself (2.8 kg) consists of a collapsible frame of aluminum tubes, with strong nylon material as the supporting material. An optional pyramidal rain fly (0.5 kg) can be attached to the webbing, and facilitates making and recording observations during rain and heavy mist. When folded into its carrying sack (40 gm), the canopy cot is easily transported in a backpack; its folded dimensions are 180 × 40 × 30 cm. The cot can be rapidly disassembled and moved from one central observation tree perch to another, in contrast with previously described wooden platforms and catwalks.

The behavior of animals differs little if at all when observed within the canopy of cloud forest or from the forest floor. Two observers with field glasses can sit on the canopy platform during observation sessions and can record bird presence and behavior in trees within tree crowns up to 100 m away. In a study of interactions between canopy birds and epiphytes (Nadkarni & Matelson, in press), observers were virtually ignored by canopy animals. Such birds as emerald toucanets, purple-throated mountaingems, and hepatic tanagers perched, vocalized, collected nesting materials, and fed within 1 m of the canopy platform.

The proximity to the animals observed provided more accurate and precise observations of behavior than would be possible from the forest floor. Details on the differences in foraging activities by particular bird species could be discerned. For example, a fruiting epiphytic shrub, *Norantea* sp. (Marcgraviaceae), was visited by 6 species of birds during a three-month study period (Nadkarni & Matelson, pers. obs.). Three species of birds consumed ripened fruits of the shrub, two other species hovered and perched on and near the bracts and extrafloral nectaries located on the pedicels, and one species foraged for invertebrates on leaf and stem surfaces. These observations, which would have

been difficult or impossible to verify if observed from the ground (23 m below), document an interesting case of birds using different resources of a single epiphytic plant. Use of the technique described here can help obtain information on the complexity of ecological interactions that occur within the canopy.

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