

A SPECIES OF *GYNACANTHA* THAT BREEDS IN CAVES (ANISOPTERA: AESHNIDAE)

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Abstract — A sp. of *Gynacantha* known to be such cave.

associated with caves, mines, overhangs and
aboriginal rock art sites in northern Australia
was found to have bred in a rimstone pool in one

Introduction

BAILEY & RICHARDS (1975) reported

taking a *Gynacantha* species from caves in the Prince Regent River Reserve of north-west Kimberley, Western Australia. The dragonfly was present during the day in large numbers and rested on the cave ceiling. Bailey & Richards noted its crepuscular activity pattern, a common, though not universal, feature of *Gynacantha* species (CORBET, 1962). COMMON & UPTON (1977) also reported the same species (*Gynacantha* sp. "n" (after WATSON, 1973, 1974; WATSON & ABBEY, 1980) from the Drysdale River National Park, north Kimberley. They stated that the species was known to be associated with streams, but thought to breed in still waters. No detailed account is available of the breeding behaviour of the species. The aim of this note is to reveal that this species does not merely rest in caves, but may, on some occasions, breed there.

The study site

The Napier Range is a limestone range derived from a Devonian barrier reef, which stretched in a NW-SE direction off what was then the south-west coast of a land mass now constituting the heart of the Kimberleys. The margin of the range has been subjected to vigorous solutional dissection so that it is extremely rugged in detail. It is in these dissected parts that caves are found. In three of these caves the *Gynacantha* referred to as species "n" by WATSON (1974) was seen. The adults rested on the walls of the caves during the day and when disturbed, flew to another part of the cave. The three caves were Tunnel Creek (125°9'E, 17°37'S), Wombarella Creek Cave (124°44'E, 17°17'S) and Old Napier Downs cave (124°39'E, 17°14'S). Two adult females were collected from Wombarella Creek Cave, which is somewhat smaller, and less treacherous, than the other two.

Old Napier Downs Cave

Old Napier Downs Cave was described in detail by JENNINGS & SWEETING (1966), from which the following description is largely taken. From the main entrance the cave extends in for about 130 m. It varies in width from 4 to 20 m and in height from 5 to 15 m. The floor of the cave is practically horizontal and is very largely composed of flowstone. A succession of rimstone dams encloses basins. It is clear that a

stream flows through the cave during some part of the wet season (November-March). No physical measurements of temperature, humidity or water chemistry of the pools were made in the present study, but details of these parameters were given by JENNINGS & SWEETING (1966) and they are unlikely to vary a great deal.

The walls of the rimstone basins were examined for the presence of exuviae. On the wall of one pool, situated about 15 m from the cave entrance, two exuviae were found, one of which was missing a large part of its abdomen. The exuviae were clinging to the wall of the basin, about 60 cm above the water surface and 10 cm below the top of the wall. The exuviae were undoubtedly those of a *Gynacantha*, not of *Austrogynacantha* Tillyard, the only other gynacanthagine genus known from the area (WATSON, 1974). The exuviae were not one of the *G. dobsoni*/*G. rosenbergi* group; they were almost certainly *Gynacantha* sp. "n" (J.A.L. Watson, pers. comm.).

Discussion

The energy source for the food chain in Old Napier Downs Cave is probably bat droppings, as it is in many tropical caves. Bats were certainly present in the cave. No systematic sampling of the rimstone basin was undertaken, so it is not possible to list the potential prey species of the *Gynacantha* larvae. However, one obvious source of food for the larvae was a gammarid shrimp, which was abundant in the rimstone basins.

Gynacantha sp. "n" is common from the west Kimberley through the Northern Territory to north Queensland (WATSON, 1974, 1977). It is, therefore, highly unlikely that the *Gynacantha* is an obligate cave-breeder, since pools in caves and in rocky overhangs are a relatively rare habitat-type. Rather the specimens in Old Napier Downs Cave probably oviposited in the rimstone basins in the same way that *Gynacantha* species oviposit in potentially temporary pools throughout the tropics (see CORBET, 1962). *Gynacantha*, being an essentially crepuscular genus, is an excellent contender for the exploitation of cave pools; adults must be well-suited to flying in dim light. *Gynacantha* species usually oviposit in plants (CORBET,

1962) but this cave-dweller must be an exception, since there were no macrophytes in the cave.

Records of odonates in caves are scarce, but PECK (1988) reported the occurrence of an *Aeshna* sp. in a cave in Ontario, Canada. WATSON (1973) and WATSON & MOULDS (1979) reported the association of *Indolestes obiri* Watson with shallow caves and overhangs along the Arnhem Land escarpment of Northern Territory, Australia. The breeding grounds of *I. obiri* are unknown, though a male was taken over a stream, apparently on territory. This species is clearly another contender for occasional cave breeding.

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