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The Invertebrate Faunas of Tropical American Caves, Part 6: Jumandi Cave, Ecuador

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SUMMARY

Twenty-two species of invertebrates are reported from Jumandi Cave, Napo Province, Ecuador. Three are probably trogloxenes, and the other 19 are troglophiles. The only troglobite is the catfish *Astroblepus pholeter*.

Little is known of the cave faunas of Ecuador. In fact, early cave reconaissance expeditions to Ecuador had difficulty in locating any caves (Gurnee, 1967). However, even though much of the country is covered by Pleistocene volcanic rocks, a surprising troglobitic fauna has been found in lava tube caves in the Ecuadorian Galapagos Islands (Leleup, 1968, 1970).

On the east facing slopes of the Andes mountain range lie various outcropings of Cretaceous limestones. In one, in the Amazonian headwaters of the Rio Pastaza (Province of Morona Santiago), lies the Cuevas de los Tayos (cave of the guacharo, or oilbird, *Steatornis caripensis* Humboldt). These remote and difficult to reach caves were the focus of an expedition in 1976 of a combined team of Ecuadorian and British scientists, supported by the Ecuadorian and British Armies. British cave biologists on the team were Drs. W.P. Ashmole and J.T. Jefferson. It is hoped that they will soon prepare a report on their cave faunal findings.

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Also in 1976, during a three month study of forest litter beetles (Peck and Kukalova-Peck, 1979), I had the opportunity to study the fauna of the most popularly known Ecuadorian cave. This is the Jumandi Cave, located 4 km N of the village of Archidona, at 600 m elevation, north of the town of Tena, in Napo Province. The caves were first brought to scientific attention with the description of a cave-evolved catfish that is endemic to them (Collette, 1962). Since then, N. and J. Leleup have collected some invertebrates in the cave, which were described by L. Chopard and A. Vandel (in Leleup, 1968, 1971). Strinati (1971) noted the presence of the two troglophilic Jumandi isopods (described by Vandel) in his review of South American biospeleology. More recently, Balazs (1972) has carefully prepared and published a map and description of the physical conditions of the cave. It is essentially a single stream passage, 791 m long, with an additional 408 m of side corridors (Figures 1 and 2). The upper galleries are generally dry. The cave passages generally have vertical walls and a flat ceiling, in a dark and silty limestone. The shallow cave stream occupies most of the cave floor and extensive silt banks are present.

The cave stream contains much finely divided plant debris so waters must enter somewhere upstream through relatively large openings. This debris feeds an acquatic invertebrate community composed only of mayfly nymphs and shrimp. No amphipods or isopods could be found. The stream water temperature was 22°C, as was the soil and air. The cave catfish probably feeds exclusively on mayfly numphs (and plant debris?). A normally pigmented characin fish, *Piabucina*, is also known from the stream and it is probably this that we saw but could not catch. The catfish is probably protected from competition with the many other fish in the streams outside of the cave by the 2 m high waterfall just inside the cave entrance. This prohibits other fish from entering the depths of the cave. We saw several of the catfish, caught one, and were impressed by the way they can use their mouth, modified into ventral sucker, to hide under and adhere to stones in the rapidly flowing stream.

Bats are scarce and localized in the cave. No large guano piles with teaming masses of gnanophiles, so common in tropical caves, were found. But much of the fauna that was present was localized near what little guano there was.

To avoid swimming across the deep pool at the base of the waterfall just inside the cave entrance, one can climb up the hill over the cave entrance and follow the trail straight back across a terrace to a fence. Following this to the north brings one to a large grove of trees growing out of a large doline sinkhole

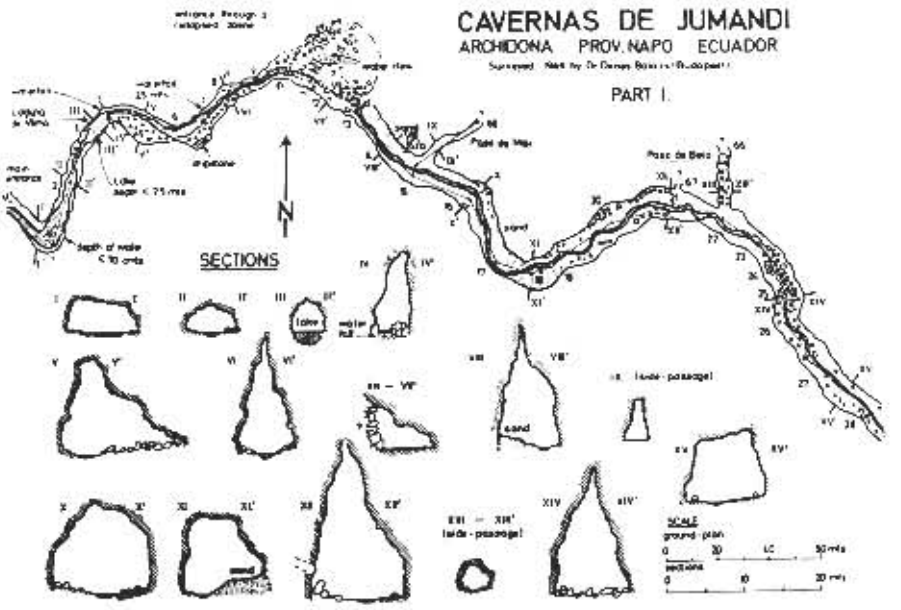

Fig. 1 - Map showing entrance portion of the Jumandi Cave (from Balazs, 1972).

forming the upper entrance to the cave. This takes one into the cave stream above the waterfall.

In addition to regular hand collecting techniques, we kicked the stream bottom stones in front of an aquatic net, and used a very small light over a suction trap for Diptera (such traps are standard for sampling Phlebotomine sandflies). This last produced no results.

ANNOTATED INVERTEBRATE FAUNAL LIST

Phylum Mollusca

Class Gastropoda

Family, genus, and species undetermined.

Several live, small, white snails were found on silt bank deep in the cave. Troglophile.

Phylum Arthropoda
Class Arachnida
Order Amblypygi
Family Phrynidae
Heterophrynus sp., W.A. Shear det.
These large, tailles whip-scorpions were abundant on the cave walls. They probably feed on the *Aclodes* crickets. Troglophile.
Order Opiliones
Family Gonyleptidae, W.A. Shear det.
Genus and species undetermined.
This family is taxonomically very confused. A large female and several white immatures were found. The adult coloration was an orange that is uncommon in the family. The immatures were most commonly found near the hanging webs of mycetophilid flies near the stream level in Paso de Dos Pisos. Troglophile.
Order Araneae
Family Dipluridae
Ishnothele sp.?, N.I. Platnick det.
This macrotheline was represented by many specimens, but all were females. This hunting spider occurred at the edges of guano piles and on stream silt banks. Troglophile.
Family Theraphosidae
Genus and species undeterminable, N.I. Platnick det.
This is a juvenile tarantula, with an eye teratology, missing two on one side of the head. Troglophile?.
Class Crustacea
Order Isopoda
Family Oniscidae
Andenoniscus narcissi Vandel (described in Leleup, 1968).
The species was described from a single specimen. I found what I think to be many of this species. Troglophile.
Family Styloniscidae
Cordioniscus leleupi Vandel (described in Leleup, 1968).
I did not find this species in the cave, the type locality. The genus is also known from caves in Mexico. Even though the eye is reduced to only three facets, Vandel considers it a troglophile.
Order Decapoda
Family Palaemonidae
Macrobrachium brasilense (Heller), H.H. Hobbs, Jr. det.
One male was caught in the stream, and others of this large shrimp were seen. This seems to be the first report of this species from a cave, but other members of the genus are frequent in caves in the Caribbean region.

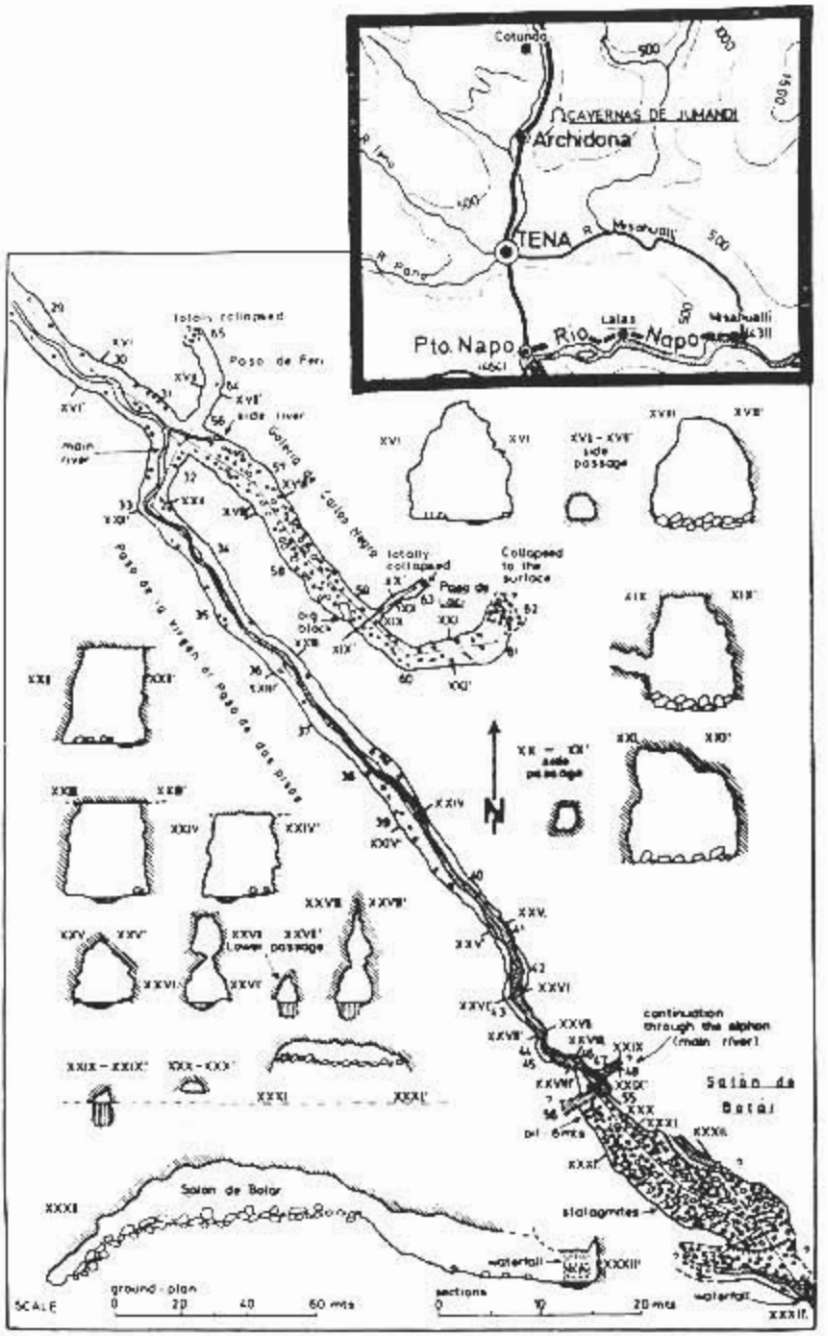

Fig. 2 - Map showing terminal portion of the Jumandi Cave, and inset of the cave location in Ecuador (from Balazs, 1972).

Family Pseudothelphusidae?
Potamocarcinus sp.?
The claw of a large freshwater crab was found in the cave, but no other indications of crabs were found. Trogloxene?
Class Diplopoda
Order Polydesmida
Family Oniscodesmidae
Oncodesmus sp.,W.A. Shear det.
Males and females were found near guano patches. The genus was described by Kraus from Peru. Troglophile.
Family Trichopolydesmidae
Gistoella (?) sp., W.A. Shear det.
Taken from guano. The genus was described from Peru by Kraus. Troglophile.
Class Insecta
Order Collembola
Family Entomobyridae
Trogalophysa sp., K. Christiansen det.
Several of these pale collembola were taken on guano. The species is undescribed. Troglophile?
Family Oncopoduridae
Oncopodura sp., K. Christiansen det.
This undescribed species, from guano, was represented by only one specimen. Troglophile?
Order Diplura
Family Campodeidae
Litocampa sp., L.M. Ferguson det.
Two females of an undescribed species were found on silt banks. The species has similarities with the endogean species *Litocampa brasiliensis* (Wygod.). Troglophile.
Order Ephemeroptera
Family Ephemeridae
Euthyplocia sp.
This genus has been identified from remains found in the stomach of the cave catfish (Collette, 1962) and these may be the mayflies that we found in the stream. Trogloxene?
Order Blattaria
Family, genus, and specie undetermined.
An 8 mm long, lightly brown colored, fully winged roach was found on a silt bank. Troglophile?
Order Orthoptera
Family Grillidae
Aclodes leleupae Chopard (described in Leleup, 1970).
This cricket genus is also found in caves from Trinidad to Panama. Trogloxene?
Order Hemiptera
Family Cydnidae

Pangaeus moestus (Stal.), R.C. Froeschner det.

These bugs were clustered around guano patches in the Galeria de Carlos Negro. The extremes of the range of this poorly known species are Guatemala, and Rio de Janeiro, Brazil (Froeschner, 1960). Troglophile.

Order Coleoptera

Family Carabidae

Pachyteles sp., G.W. Bal det.

These oezanine carabids were at guano in the Galeria de Carlos Negro. Other *Pachyteles* occur in caves in Mexico. Troglophile.

Family Catopidae

Adelopsis sp., S.B. Peck det.

On guano throughout the cave, common but scattered. Several distinct populations of this genus are known from caves in Trinidad and Venezuela. Troglophile.

Family Staphylinidae

Atheta sp., S.B. Peck det.

These small aleocharines are abundantly found in caves in virtually all countries. Troglophile.

Order Diptera

Family Mycetophilidae

Genus and species undetermined.

The suspended webs of this fungus gnat were found near the cave entrance and throughout the cave, especially under ledges above the stream. No adults were seen. The genus may be *Orfelia* or near it. See peck and Russell (1976) for a review of web spinning flies, and Jackson (1974) and Matile (1977). Troglophile.

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LITERATURE CITED

BALAZS, D. 1972. The Jumandi Caves of Ecuador. Natl. Speleol. Soc. News, 30: 70-72.

COLLETTE, B. 1962. *Astroblepus pholeter*, a new species of cave-dwelling catfish from eastern Ecuador. Proc. Biol. Soc. Washington, 75: 311-314.

FROESCHNER, C. 1960. Cydnidae of the Western Hemisphere. United States Natl. Mus. Proc., 111: 337-880.
GURNEE, R. 1967. The caves of Ecuador? Natl. Speleol. Soc. News, 25: 94-97.
JACKSON, J. F. 1974. Goldschmidt's dilemma resolved: Notes on the larval behavior of a new Neotropical web-spinning mycetophilid (Diptera). Amer. Mid. Natur., 92: 240-245.
LELEUP, N. and J. LELEUP. 1968, 1970. Mission zoologique belge aus iles Galapagos et en Ecuador. Resultats scientific. Koninklijk Museum voor Midden-Africa, Tervuren. Premier partie, 1968, 272 pp; deuxieme partie. 1970, 236 pp.
MATILE, L. 1977. Un Keroplatinae cavernicole noveau de Cuba (Diptera, Mycetophilidae). Résultats des Expéditions Biospéologiques Cubano-Romaines à Cuba, vol. 2, Bucharest, 369-371.
PECK, B. and J. KUKALOWVA-PECK. 1979. A guide to natural history field localities in Ecuador. Stud. Neotrop. Fauna Environ., in press.
PECK, B. and D. R. RUSSELL. 1976. Life history of the fungus gnat *Macrocera nobilis* in American caves (Diptera; Mycetophilidae). Canadian Entomol., 108: 1235-1241.
STRINATI, P. 1971. Recherches biospéologiques en Amerique du Sud. Annal. Spéléol., 26: 439-450.