

# A new poison-dart frog (*Dendrobates*) from northern central Guyana (Amphibia: Anura: Dendrobatidae)

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## Abstract

We describe a new poison-dart frog from Rockstone, northern central Guyana, collected in the 1980s as a single specimen. Preserved in alcohol it bears ill-defined light grey spots on a dark ground dorsally that merge to form a reticulate pattern laterally. Ventrally the frog is dark brown with a few light brown blotches. Colouration in life is unknown. The frog is medium sized (24.5 mm), provisionally placed with the *Dendrobates tinctorius* group and only known from the holotype.

Key words: Anura: Dendrobatidae: *Dendrobates nubeculosus* sp. n.; Guyana; taxonomy.

## 1 Introduction

Numerous species of the cryptically coloured dendrobatid genus *Colostethus* COPE, 1866 are known from the Guayana Shield north of the Amazon River in northern Brazil, French Guiana, Surinam, Guyana, and southern Venezuela. Recent records have raised the number of species considerably to about 18 (FROST 2002, LA MARCA 1996, MEINHARDT & PARMELEE 1996, MYERS & DONNELLY 1997, 2001), whereas the number of conspicuously coloured “true” poison-dart frogs has been almost unchanged, with only two descriptions in the last 30 years, *Epipedobates pulchripectus* (SILVERSTONE, 1976) and *Allobates rufulus* (GORZULA, “1988” 1990). For more than 18 years we have been aware of a single specimen of an undescribed species of *Dendrobates* WAGLER, 1830 from Guyana. In the 1980s ornithologists executed fieldwork in Guyana and were also able to take photographs of and collect a few specimens of anurans. We had the opportunity to evaluate part of their photographic material, including the backpack transport of juveniles in *Stefania evansi* (BOULENGER, 1904), more than twelve years ago (JUNGFER & BOEHME 1991). The species was found in and around a cave near the Ataro River, about 30 km north of Mount Roraima at 700 m a.s.l. Two adults (ZFMK 47701-2) were collected. Among other frogs from the same locality is another species of the genus, *S. roraimae* DUELLMAN & HOOGMOED, 1984 (ZFMK 47699-70). This is the third locality the species is known from (DUELLMAN & HOOGMOED 1984, MACCULLOCH & LATHROP 2002). It is situated at a much lower altitude than previously known sites (1400-1550 m). *Osteocephalus leprieurii* (DUMÉRIL & BIBRON, 1841) (ZFMK 47689-91) from the same locality were used in a redescription of the species by JUNGFER & HÖDL (2002).

Despite the long time that has passed since then no other material of the unique specimen of *Dendrobates* could be gathered and we have finally decided to draw attention to the frog by a description.

## 2 Material and Methods

Snout-to-vent lengths (SVL), head lengths and other measurements of preserved frogs were taken with dial calipers or, if shorter than 10 mm, under a stereo microscope with ocular micrometer and rounded to the nearest 0.1 mm. Terminology for dendrobatid frogs follows SILVERSTONE (1975). ZFMK is the acronym for Zoologisches Forschungsinstitut und Museum Alexander Koenig, Bonn.

### 3 Systematics

#### *Dendrobates nubeculosus* sp. n.

(Fig. 1a-c)

Holotype: ZFMK 45354, an adult male collected at Rockstone, Essequibo River, Mazaruni Potaro District, Guyana, by ERWIN LENKENHOFF in October 1984.

Diagnosis: A species of *Dendrobates* as characterized by the first finger, which is shorter than the second, the lack of webbing between the toes, absence of premaxillary and maxillary teeth. *Dendrobates nubeculosus* is a species (1) of medium size (24.5 mm SVL in male holotype); (2) with weakly granular dorsum and (3) smooth venter and limbs; (4) tarsal tubercle absent; (5) dark dorsum with ill-defined light spots and (6) dark venter with few light spots.

*Dendrobates nubeculosus* differs from all other species of the genus in northern South America east of the Andes by the following characters (those of *D. nubeculosus* in parentheses): *Dendrobates leucomelas* FITZINGER, 1864 is a larger frog, 30.5-35.0 mm SVL in males (SILVERSTONE 1975) (24.5 mm) with three broad light transverse bands, interspersed with black intrusions, across the dorsal surfaces (light spots). *Dendrobates azureus* HOOGMOED, 1969 and *D. tinctorius* (SCHNEIDER, 1799) are larger frogs, 38.5-39.5 mm and 34.0-46.5 mm SVL in males (SILVERSTONE 1975), with reticulate venters (few light spots). The tympanum of *D. azureus* is only about one third the diameter of the eye (one half). *Dendrobates galactonotus* FITZINGER, 1864 usually has uniform dark or light dorsal colours and a conspicuous tarsal tubercle (absent). *Dendrobates truncatus* (COPE, 1861) has light dorsolateral and lateral stripes (spots). Two species are distinctly smaller, not exceeding 18 mm SVL: *Dendrobates* (= *Minyobates* MYERS, 1987) *steyermarki* RIVERO, 1971 is dull to bright red dorsally, often with irregular black spots (dark with larger light spots), and the Guianan frog currently referred to as *D. ventrimaculatus* SHREVE, 1935 (CALDWELL & MYERS 1990, LESCURE & MARTY 2000) has a bright golden yellow reticulum dorsally and black dots on dark ground on the limbs. *Dendrobates castaneoticus* CALDWELL & MYERS, 1990 from Para, Brazil, has well defined small light spots and/or streaks on dorsum and flanks (ill-defined spots forming reticulum laterally), and also differs in having large light (orange) flecks on the upper arms, thighs, and shanks. Another species described as *Dendrobates* in the original description, *D. rufulus* GORZULA, "1988" 1990, is characterized by maxillary and premaxillary teeth and basal toe webbing. It must therefore be regarded a member of those species in the *femoralis* group (of SILVERSTONE 1976) occurring east of the Andes that are currently placed in the genus *Allobates* ZIMMERMANN & ZIMMERMANN, 1988.

Four species of *Dendrobates* from other regions have a dorsal pattern of light spots on dark ground that resemble that of *D. nubeculosus*. *Dendrobates mysteriosus* MYERS, 1982 from northern Peru bears well defined light spots that are evenly distributed over all body surfaces (ill-defined and reduced in number ventrally); *D. arboreus* MYERS, DALY & MARTÍNEZ, 1984 from western Panama is a smaller frog with males reaching 22 mm SVL and large discs. The disc on Finger III is more than twice as wide as the finger at midlevel of the penultimate phalanx (about twice as wide). Furthermore, the light spots are always discrete and never merge, as in *D. nubeculosus*. Some populations of the polymorphic *D. histrionicus* BERTHOLD, 1845 and *D. sylvaticus* FUNKHOUSER, 1956 (for colour morphs see SILVERSTONE 1975, MYERS & DALY 1976, LÖTTERS et al. 1999) from the Pacific versant of Colombia and northwestern Ecuador resemble *D. nubecu-*

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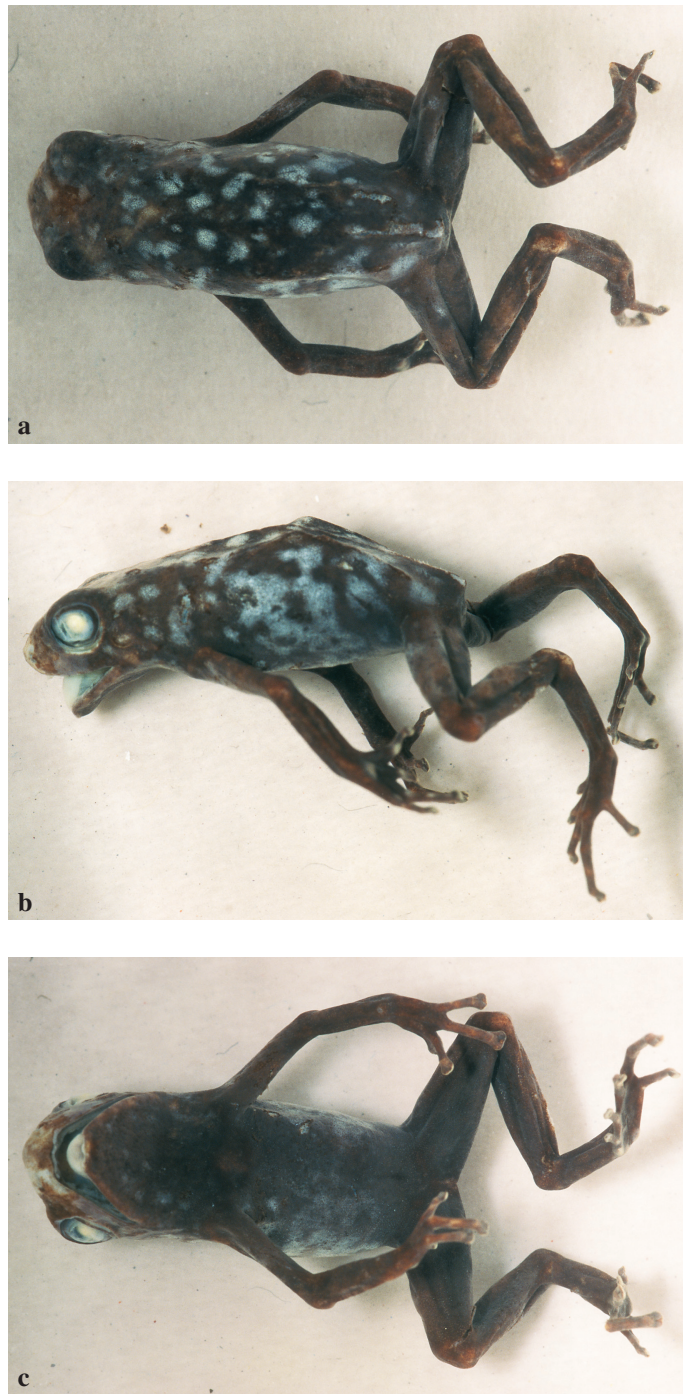


Fig. 1. Holotype of *Dendrobates nubeculosus* sp. n. (ZFMK 45354) in (a) dorsal, (b) lateral and (c) ventral view.  
Holotypus von *Dendrobates nubeculosus* sp. n. (ZFMK 45354), (a) Dorsal-, (b) Lateral- und (c) Ventralansicht.

*losus* in preservative. They are usually larger, about 30 mm SVL, and bear a distinct ovoid or elliptical inner metatarsal tubercle (indistinct, oblong). Their snouts are truncate to bluntly rounded in dorsal view (round). “*Dendrobates*” *maculatus* PETERS, 1873, a frog of doubtful provenance and systematic allocation, probably from western Panama, is spotted dorsally and laterally, but unlike other *Dendrobates*, has Finger I slightly longer than Finger II (MYERS 1982).

**Description:** Head round in dorsal view, bluntly rounded in lateral view. Canthus rostralis round, loreal region slightly convex. Tongue oblong, barely wider posteriorly than anteriorly. Vocal slits positioned below the posterolateral margins of the tongue. Premaxillary and maxillary teeth absent. Tympanum round, about half the diameter of the eye. Tympanic annulus of left tympanum visible from 6 h to 11 h (viewing tympanum as a clock), rest of tympanum posterodorsally covered by thick skin. Nostrils open posterolaterally.

Skin weakly granular dorsally and laterally, smooth ventrally and on limbs, except ventral surfaces of thighs, which are weakly granular. First finger shorter than second. Relative lengths of appressed fingers III>IV>II>I. Disc of Finger III about twice as wide as finger at midlevel of penultimate phalanx. Subarticular tubercles single, a large round outer metacarpal tubercle present.

Relative lengths of appressed toes IV>III>V>II>I. Webbing absent. Sole of foot smooth. An indistinct oblong inner and a round outer metatarsal tubercle. A barely visible tarsal fold (in the rather ethanol dried specimen) about 1/3 the length of the tarsus. Tarsal tubercle at proximal end of tarsal fold absent. Cloacal opening situated at level of upper edges of thighs, with moderate flap of skin dorsally.

**Colouration:** In alcohol, ground colouration of all surfaces dark brown. Dorsal surfaces of head and body with numerous irregular, ill-defined light grey spots (creamy white or yellow in life?), laterally on the body these spots merge to form an irregularly reticulate pattern. Legs and side of head uniformly dark brown, although a few small light spots may have darkened on the dorsal surfaces of the humeri. Ventrally two light brown spots in the pectoral area and a light grey spot on mid-venter. When the specimen is removed from preservative for a few minutes and starts to dry several reddish brown areas appear on the posterior part of the abdomen, dorsally and laterally on the thighs and in the interorbital area, which might indicate lighter reddish brown colouration in the living frog. Colouration in life is unknown.

**Measurements** (in mm): SVL 24.5, head length 8.2, head width 8.0, tibia length 10.3, foot length 14.8, eye diameter 3.0, tympanum diameter 1.6, width of disc of Finger III 1.1, distance from eye to nostril 2.5, internarial distance 3.1, distance from tympanum to eye 0.6.

**Distribution and habitat:** No data accompany the holotype and only known specimen. The collecting site was noted as Rockstone (5°58'N, 58°32'W), a town on the Essequibo River at 7 m above sea level. The vegetation in the area is lowland tall evergreen flooded riparian forest (HUBER et al. 1995).

**Etymology:** The species name *nubeculosus* is Latin meaning “covered with small clouds” in allusion to the small ill-defined dorsal spots.

#### 4 Discussion

In the absence of more material and especially data on the behaviour and molecular genetics, the medium size, stout body, angular back and relatively short legs provi-

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sionally allow us to place *D. nubeculosus* with the *Dendrobates tinctorius* group (sensu MYERS 1987). *Dendrobates leucomelas* has a skin texture and short legs similar to the new species and is probably its closest relative.

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#### Ein neuer Pfeilgiftfrosch aus dem nördlichen Zentral-Guyana

Wir beschreiben einen neuen Pfeilgiftfrosch aus dem nördlich-zentralen Teil Guyanas. Das mittelgroße (24,5 mm) einzelne Tier wurde bereits 1984 am Essequibo-Fluss bei Rockstone gesammelt und lässt sich mit seiner Merkmalskombination keiner bekannten Art der Gattung zuweisen. Es zeigt – in alkohol-konserviertem Zustand – dorsal undeutlich begrenzte, hellgraue Flecken, die lateral verschwommen netzartig ineinander übergehen und ein gewölktes (Name!) Muster ergeben. Die Ventralseite des Frosches ist dunkelbraun mit wenigen hellbraunen Flecken. Über die Lebendfärbung können noch keine Aussagen gemacht werden. Wir rechnen die neue Art vorläufig der *tinctorius*-Gruppe innerhalb der Gattung *Dendrobates* zu.

Schlagwörter: Anura: Dendrobatidae: *Dendrobates nubeculosus* sp. n.; Guyana; Taxonomie.

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